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A NOTE ON THEORY AND REALITY
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Volume XII May 1960 Number 3

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THE PROFESSIONAL GEOGRAPHER

VOLUME XII MAY 1960 NUMBER 3

FACTORS INFLUENCING DISTRIBUTION OF STEAM-ELECTRIC GENERATING PLANTS*

George F. Deasy and Phyllis R. Griess

The Pennsylvania State University

SOME 700 billion KWH of electricity are generated in the United States each year. Much of this energy is produced by steam-powered generating plants of large capacity. Various factors influence the distribution of such plants, including especially fuel, market, and water. (*1*) Labor and capital are of negligible significance as localizing factors, since both are highly mobile within the country.

In an attempt to determine the relative significance of fuel, market, and water as localizing factors in the electric generating industry, a cartographic analysis is herein made of the situation in Pennsylvania. It is reasonable to assume that the conclusions derived from such a type study are applicable to the nation as a whole.

The technique employed in this analysis involves plotting the distribution of all generating plants in the State having a name-plate capacity of over 25 megawatts on three successive base maps showing, respectively: (1) areas of low-cost fuel, (2) areas of above average market demand for electricity, and (3) major water bodies. The extent of correlation between power plants and potential localizing factors is then determined by visual inspection of each map and arithmetical tabulation of

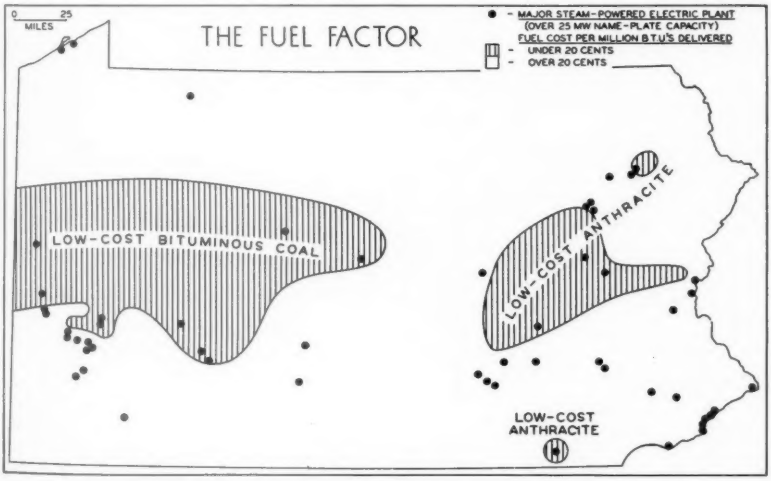

FIG. 1. Fuel as a factor in the localization of steam-electric generating plants in Pennsylvania.

the results.

The fuel factor. Fuel costs at steam-electric plants differ considerably from place to place in Pennsylvania, ranging from 11 to 36 cents per million BTU's delivered at the plant. Hence, if fuel plays a major role in determining power plant distribution, there should be close correlation between areas of available low-cost fuel and the distribution of steam-powered generating stations.

Analysis of delivered fuel costs for electric generation reveals four areas of low-cost energy (under 20 cents per million BTU's) in the State, one coinciding with the middle tier of bituminous coal producing counties in the western half of the State, two corresponding approximately with parts of the anthracite producing counties in the east-central part of the State, and a fourth representing a small area in the southeast where river-dredged anthracite is available (Fig.1). A plot of the major generating plants on the fuel-cost map reveals relatively little correlation. Among 55 such plants, only 13 are situated within areas of low-cost fuel; and some 11 of these 13 plants are found on, or very close to, the boundaries of these areas (Fig. 1). Apparently, therefore, fuel is a relatively insignificant factor in localizing steam-electric generating plants.

The market factor. Broadly speaking, the size of the market for electricity among regions of homogeneous technological development is a function of population; the greater the number of people, the greater the demand for electricity. Population, and therefore the market for electricity, differs considerably in degree of concentration throughout Pennsylvania. Thus, if market is a significant localizing factor for electric generating plants, there should be pronounced correlation between areas of most concentrated population (market) and the location of generating stations.

There are two major and one minor areas of population concentration in Pennsylvania (Fig. 2). That in the southwest includes Allegheny County (with Pittsburgh) and an associated cluster of five nearby counties; that in the east includes Philadelphia County and 13 other counties. Erie County, in the northwest, is a minor center of population concentration. Each of the counties in these three areas has a population in excess of the county average for the State as a whole (164,422); and each, therefore, constitutes an above average market for electricity.

A plot of the major electric generating plants on such a market map indicates a

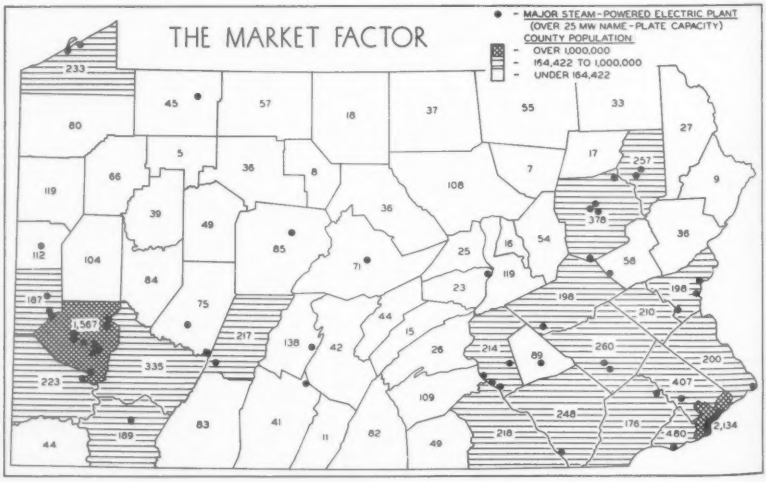

FIG. 2. Market as a factor in the localization of steam-electric generating plants in Pennsylvania. County figures indicate population, in thousands.

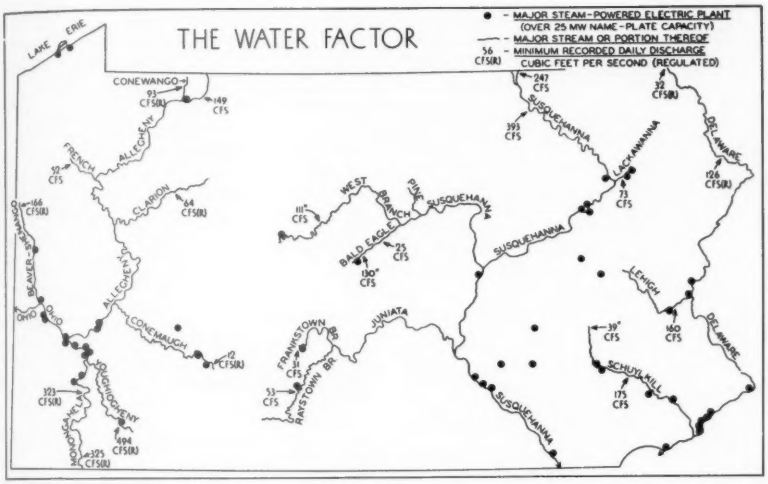

FIG. 3. Water as a factor in the localization of steam-electric generating plants in Pennsylvania. Minimum recorded discharge figures at selected stream gaging stations are shown. The letter "R" in parentheses indicates that water flow is regulated upstream from the gaging station by reservoir. Figures followed by an "X" are based on short-term records; long term figures would be much lower.

high degree of correlation (Fig. 2). Of the 55 such plants, all but 10 are located within counties having above average market potential. Allegheny County, with 10 plants, is a particularly striking example of the effect of the market factor on plant localization. It is evident, therefore, that at the present stage of technological development in the electric generating industry, it is less expensive to ship the fuel necessary to generate a given quantity of electric energy a given distance, than it is to transmit to market after generation the same quantity of electric energy the same distance. That *some* generating stations are located outside the major market areas is a reflection of the fact that such low market potential areas are not economic voids, and merely confirms the significance of the market factor as a localizing agent.

The water factor. The raw material utilized in greatest quantity in the electric generating industry, and therefore the one least economically transportable, is not fuel but instead water. (2). The water necessary for condensation purposes in a single large modern steam plant exceeds by several times that required for all other purposes in a sizable metropolis. Large supplies of perennially available fresh water are restricted to limited portions of Pennsylvania, namely narrow ribbons of territory bordering the major rivers and the shore of Lake Erie. Therefore, if water is significant as a localizing factor in the electric generating industry, a close correlation should exist between such areas and the distribution of generating plants.

An analysis of minimum recorded stream flow data for the rivers and creeks of Pennsylvania discloses three stream networks along whose main stems and major tributaries there is a sufficient supply of water to meet the requirements of large generating plants (Fig. 3). The Ohio-Allegheny-Monongahela rivers, with tributaries, provide a water source for the western part of the State; the Susquehanna River, with tributaries, services the central and part of the eastern sections of the State; and the Delaware River and right bank tributaries provide adequate water to the easternmost portion of the State. Lake Erie water is available to territory in the far northwest.

A plot of the major electric generating plants on the water factor map discloses a very close relationship (Fig. 3). Only six of the 55 plants are not located close

to a large and reliable source of water; and communications from responsible individuals connected with four of the six atypical plants indicate that not only is water supply a critical problem of the present, but that future economical expansion of generating capacity at such plants will be prevented by lack of available additional water. Obviously, the water factor plays a major role in the localization of generating plants, since it is less expensive to move both fuel and generated electricity than it is to transport the huge volumes of water required by modern power plants.

Summary and conclusions. The relative significance of various factors in determining the distribution of steam-electric generating capacity in Pennsylvania has been analyzed above. Labor and capital were dismissed as insignificant. Fuel was shown to be relatively unimportant as a localizing factor in the State. The broad distributional pattern of generating facilities in the Commonwealth was cartographically correlated with the market factor; and, both within and without the major market areas, the availability of an appropriate water supply was demonstrated to be a most critical element in restricting potential plant sites. Such generalizations probably apply also to the localization of steam-electric plants elsewhere in the United States.

Space limitations prevent discussion of specific factors influencing selection of precise plant locations along streams, on a plant by plant basis. Involved would be such items as relative cost of land for building sites, availability of adequate fuel transport facilities, local variations in the quality of the water supply, the problem of integrating new stations into an established plant and transmission network, territorial boundaries of electric utility company service areas, and other factors of a similar nature.

The future distributional pattern of large steam-electric generating plants in Pennsylvania, and in the nation, will depend upon technological changes. *(3)* Advances in efficient long-distance transmission of high-voltage power will tend to shift electric generation toward sources of low-cost fuel. Conversely, developments lowering the cost of fuel transportation, such as the coal pipeline now operating in Ohio or the use of atomic fuels, as well as continued reductions in the amount of fuel required per KWH of electricity, will reemphasize the present market orientation of the generating industry. Improved techniques in low-cost recycling of cooling water conceivably could free steam-electric generating plants from their present bondage to large water bodies. Thus, the relative significance of localizing factors could be radically altered in the future.

° ° °

(°) Contribution No. 59-62 from the College of Mineral Industries, The Pennsylvania State University.

(1) Zimmermann, E.W., *World Resources and Industries*, Harper and Brothers, New York, 1951, pp. 608-609.

(2) Graham, J.B. and Burrill, M.F., eds., *Water for Industry*, American Association for the Advancement of Science, Washington, D.C., 1956, p. 109 and *passim*.

(3) "Expansion by Electric Utility Companies, Fourth District," *Monthly Business Review* (Federal Reserve Bank of Cleveland), Oct., 1959, pp. 8-11.

A NOTE ON THEORY AND REALITY

Leslie J. King

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THE CURRENT discussion between Mr. Lukermann and Mr. Berry raises some interesting philosophical questions concerning the nature of theory and its relationship to reality. *(1)* These questions are all the more interesting because, in the field of urban geography for example, geographers are strongly criticized by a sociologist, Egon G. Bergel, for their emphasis on Central Place Theory which he contends "is patently at variance with the facts." *(2)* Bergel cites the example of Washington,

D.C. being 36 miles south of Baltimore and yet 110 miles north of Richmond as evidence of the failure of Central Place Theory to explain reality.

From a logical viewpoint Bergel's criticism is invalid. Not only does he disregard the limiting assumptions underlying Central Place Theory, but he also misinterprets the nature of the theory itself. In the introduction to his famous work, *Die Zentralen Orte in Suddeutschland*, Christaller himself insists that the greater part of his Central Place Theory is deductively derived and

> "hence the theory has a validity completely independent of what reality looks like only by virtue of its logic and the satisfying level of knowledge. This *co ipso* theory is then confronted with reality. In meeting this problem, it becomes clear to what extent reality corresponds to theory and to what extent it is explained by it, and in what respects reality does not correspond with the theory and therefore is not explained by it. These unexplained facts have then to be clarified by historical and geographical methods because they are concerned with personal, historical and naturally-conditioned 'resistances' – factors which result in deviations from the theory. They have nothing to do with the theory itself and above all cannot be cited directly as proof against the validity of the theory." *(3)*

Mr. Lukermann would obviously agree with the definition of a theory as a group of laws deductively connected. Bergmann gives a more precise definition of a theory as

> "a group of laws, usually rather few, from which others, usually a larger number, have actually been deduced, and from which one expects to deduce still further ones. The laws that serve as the premises of these deductions are called the axioms of the theory; those which appear as conclusions are called its theorems." *(4)*

The lower-order laws, or original premises of a theory, are generally arrived at by a process of induction. For this reason it is suggested that the structure of science rests on the three pillars of observation, induction, and deduction. *(4)* The primary way of acquiring knowledge of lawfulness is by means of observation and then by inducing a simple law. This law is then used as a premise, and from this, together with a second basic premise or even a second observation, a conclusion is deduced. For example, ***all water if heated to 100° C. boils*** (assuming altitude and other conditions are equal); ***this water is being heated;*** conclusion, ***this water will boil.*** Furthermore, once this law is established as a sound generalization, then it is possible to explain reality by alluding to it. ***Why does this water boil?*** We refer to our simple law, ***all water when heated boils;*** we then observe that ***this water is being heated,*** and we deduce the conclusion. In this sense, laws or a theory provide an explanation of reality, but there is always the uncertainty of induction to be considered. This uncertainty is implied in Mr. Lukermann's use of the term hypothesis, for in a sense all laws are hypotheses, in that there is always the logical possibility that a new observation will refute the original generalization. Therefore, in a strict sense, there is nothing final or dogmatic in science. However, unsound generalizations are eventually refuted, and as science progresses, the degree of certainty (or the level of probability) increases. No one would deny, for example, that the theory of Newtonian mechanics provides a very close approximation to the reality of the celestial system. Mr. Lukermann's contention, therefore, that a model or theory "has reference only to its hypotheses" appears to be an understatement of the role of theory in science. Admittedly a theory is a "logico-mathematical formulation of a specific set of hypotheses" in that it consists of a group of laws deductively connected, and in so far as the deductive process is involved, then the structure of the theory is tautological. However, the laws or hypotheses upon which this structure is built are generalizations based upon observation of reality, and the verification of any theory ultimately lies in the degree to which it approximates this reality. As Christaller insists, any deviations from the theory are not necessarily proof against its validity; they do serve, however, to point up inadequacies of the premises or axioms. Thus, in the middle of the nineteenth century, it was discovered that certain perturbations in the ellipses did not fit into the existing theory of celestial mechanics. The subsequent discovery of the planet Venus in 1846, as a result of mathematical computations by Leverrier, represents a triumph for Newtonian mechanics.

There appears to be no logical basis

for denying with respect to the social sciences, such as geography, that present theories can be expanded and modified to provide a closer approximation of the reality to which they apply.

One final point might be noted. Mr. Lukermann is obviously disturbed by the so-called borrowing of theories from physics and mechanics, whereas Mr. Berry ascribes any similarity in the form of the theories and models to mere coincidence. Although both undoubtedly subscribe to some form of scientific determinism, in other words the idea that the world is comprehensibly lawful, they appear to disregard the theses of mechanism and psychophysiological parallelism, according to which psychology and physiology are reducible to physics and chemistry, and no mental variables are required. *(5)* Both of these theses are fashionable in contemporary scientific thought, and it may well be that the correspondence between, for example, the population-potential model and the theory of Newtonian mechanics is no mere coincidence after all.

° ° °

(1) Lukermann, F., "Toward a More Geographic Economic Geography," *The Professional Geographer*, Vol. X, No. 4, July, 1958, pp. 2-10.
..... "On Explanation, Model, and Description," *The Professional Geographer*, Vol. XII, No. 1, January, 1960, pp. 1-2.
Berry, B.J.L., "Further Comments Concerning 'Geographic' and 'Economic' Economic Geography," *The Professional Geographer*, Vol. XI, No. 1, Part I, January, 1959, pp. 11-12.
(2) Bergel, E.G., *Urban Sociology*, McGraw-Hill, New York, 1955, p. 64.
(3) Baskin, C.W., *A Critique and Translation of Walter Christaller's Die Zentralen Orte in Suddeutschland*, unpublished Ph.D. dissertation, Department of Economics, University of Virginia, Charlottesville, 1957, pp. 102-103.
(4) Bergmann, G., *Philosophy of Science*, University of Wisconsin Press, Madison, 1957, pp. 31-32.
(5) Ibid., pp. 107, 162-171.

AN OPERATING SCHEME FOR HUMID TROPICAL LAND INVENTORIES

Arthur H. Doerr

University of Oklahoma

MANY GROUPS are interested in land inventories, and among them land economists and geographers stand in the forefront. Inventories of various types have been undertaken in diverse areas, such as England, Chile, the T.V.A. area of the United States, Tasmania, and Puerto Rico, by men with widely different backgrounds, skills, and purposes. Previous inventories were undertaken normally in response to an immediate or potential need. Heterogeneity of techniques, different scales of mapping, varying skills and care of the field workers, and environmental differences have made past inventories largely of local, rather than international, significance. That is, techniques, procedures, and results have not had widespread applicability.

Because of the complexity of the world's landscapes, it is difficult to evolve a scheme which has universal utility. The author, however, herein suggests the framework of a scheme which, it is believed, will have widespread and perhaps universal value in humid tropical regions. This scheme evolved as an outgrowth of planning for, and participation in, the Rural Land Classification Program in Puerto Rico in 1949-51, and continued library and laboratory research in tropical land use, along with recent field research in the Republic of the Philippines.

Problem, procedure, and technique. Geographers, land economists, and others have employed a variety of techniques in land classification in the middle latitudes. *(1)* Selection of a single method from the welter of different, often antithetical, systems is a difficult task. For example, in what detail should the mapping be done? What should

be used as a mapping base? How many features of the physical and cultural environment should be included? These and other questions have to be answered before satisfactory progress can be made on the evolution of a single land inventory scheme. Techniques employed in the Rural Land Classification Program of Puerto Rico *(2)* provide a point of departure in the evolution of a satisfactory tropical land use system, because they proved eminently workable in the field and results have had considerable merit and utility. Although the author makes no claim to great sagacity, an analysis of much of the available literature, plus detailed field work in tropical areas, leads to the conclusion that the scheme outlined in this paper is sound.

The technique of mapping outlined herein is the so-called unit area method. In this method pieces of land are divided into units which possess complete homogeneity, within practical limits, of every aspect of the physical and cultural environment. If any facet of either the human or physical environment changes significantly, a new unit, which possess complete homogeneity, described by using a fractional code in which a two- or three-digit numerator characterizes human use of the land and a five-digit denominator describes salient physical characteristics. For example, $\frac{243}{11134}$ describes land use and quality in the numerator and physical characteristics in the denominator. In the key detailed forthwith, the figure 2 of the numerator denotes pasture land, 4 indicates marsh grass pasture, and 3 indicates poor quality pasture. In the denominator, the first 1 suggests level land, the second 1 is used for well drained land, the third 1 refers to no observable erosion, the 3 indicates stony land, and the 4 describes hardpan or claypan soil. As land use and quality or physical characteristics vary, a new unit is described. It can be seen by definition of unit area, therefore, that the change of a single digit in either the numerator or denominator will result in the delimitation of an additional unit area.

Mapping can be accomplished utilizing the fractional code technique on a variety of bases, ranging from simple or detailed maps to aerial photographs. For speed and accuracy, recent aerial photographs are superior to other bases. Aerial photographs have the additional advantage that a skilled mapper with experience in a specific locale can soon map large areas through aerial photograph interpretation with a minimum of ground control. It must be emphasized, however, that such interpretations should be undertaken only by an expert operating within a locale with which he has intimate familiarity. Further, no such large scale interpretations should be undertaken without frequent validating field checks.

The fractional code system can be utilized at practically any base map or base photo scale, but for inventories to be of significant planning use they should be undertaken on a large scale. Thus, it is advisable to use photographs with a scale of at least 1:10,000, and preferably larger. Photographs with a scale of 1:10,000 permit mapping of units as small as one acre: in certain very crowded lands, or in areas of potential re-settlement, it is important to be able to show the characteristics of areas this small or even smaller.

Questionnaires, to be employed on a random sampling basis, should probably be utilized to acquire additional information on agricultural, lumbering, mining, or other land use techniques. Such questionnaires should be placed in the hands of native interviewers who are familiar with the local languages and customs. It is important that such an interviewer be part of a mapping team, even if the mapper is familiar with the indigenous culture and language. A native of the country can facilitate movements within a strange area, and he is helpful in alleviating suspicions of the natives. No attempt is made to detail questionnaires in this study, since local conditions and prerequisites of the individual inventory should dictate the preparation of interview forms.

Mapping physical characteristics. The slope categories that comprise the first digit in the denominator of the fractional classification code are patterned almost directly after those used in the Rural Land Classification Program of Puerto Rico. The choices made then, and largely repeated here, are based on the potential use of agricultural machinery in each of the various slope categories. Slope can be measured in the field with a clinometer or similar device, although the skilled field worker soon gains sufficient familiarity with terrain to enable him to make accurate value judgments without resort to mechanical aid. The direction of slope shown by an arrow pointing down grade is useful, particularly in planning irrigation and drainage facilities.

Drainage, the second digit in the denominator, is something of a qualitative matter, and it takes skill to enable a mapper to detect well drained areas during a very wet period or poorly drained regions at the end of a long dry period. This difficulty can be overcome, however, by close observance of slope and soil conditions as related to drainage.

The third digit of the denominator, erosion, is of considerable significance since it affects soil fertility and cultivation. It should be borne in mind, however, that certain tropical soils probably benefit from erosion. In such a case a field note to that effect should be recorded, since erosion is normally deleterious. Again, the field worker must exercise care in assigning an area to a specific erosion class. Frequently this must be done deductively by observation of adjacent areas, or by correlation of slope, drainage, and soil type.

Stoniness, the fourth digit of the denominator, is perhaps the easiest of the physical characteristics to map. The definitions are quite clearly drawn, and a minimum of field experience is necessary to successfully apply them.

If stoniness is the least difficult to map, certainly soils, the fifth denominator digit, are the most difficult. Indeed, the problem of establishing and implementing a workable key is almost insuperable. Some of the more pressing problems which demand solution are enumerated below. How much soil detail shall be attempted, especially when few field teams are thoroughly trained in soils? What details of soil are particularly valid? Texture? Structure? Organic content? pH? Profile? Mineral composition? Assumed fertility? Depth? Detailed mapping of every soil series, type, and phase within humid tropical regions is, for the present at least, an impossible task. The soils key, as evolved, consolidates tropical soils on the basis of the literature and the author's personal field experience in tropical regions. Final choice of the soils key was dictated by the practical realization that men of different skills and backgrounds would be employing the key, and hence it should possess the necessary simplicity and still have considerable utility. Such a generalized key should focus attention on likely areas for resettlement or intensification of land use. When such attention is focused, a soils mapping team of experts can be dispatched to supply detailed soil analyses.

Mapping land use characteristics. The three digit numerator employed to depict land use and quality is outlined below in considerable detail, and only a few comments are necessary here. Crops and crop combinations are omitted from the key because of the heterogeneity of dominances from place to place.

Forest and brush lands present problems because there is always the temptation to map forest associations. This temptation is particularly strong because of the variety of species encountered in a tropical forest environment. The definitions for forest or brush lands are arbitrary and are aimed at defining quality in terms of potential lumbering.

Summary. The techniques and keys outlined herein represent an effort to establish a scheme of land classification which will prove universally applicable throughout the humid tropical regions. Explanations of difficulties encountered, and certain aspects of the key, are set forth above. Definitions of each digit employed in the fractional classification code are given below.

CODE FOR PHYSICAL CHARACTERISTICS

SLOPE (*First Digit, Denominator*)

1. **Level to Undulating** (0° to 2°; 0% to 3%)
   Land which, in terms of slope, presents no problems in the use of agricultural machinery.
2. **Undulating to Rolling** (2° to 7°; 3% to 12%)
   Land which, in terms of slope, presents some problems in the use of agricultural machinery. Near the upper limit of this class special land management programs, such as terracing or contour cultivation, may be necessary.
3. **Rolling to Rough** (7° to 12°; 12% to 20%)
   Farm machinery use limited although special land management, such as terracing, may facilitate its use.
4. **Rough to Rugged** (12° to 22°; 20% to 40%)
   Land with slopes so great as to produce serious problems of land management. The use of farm machinery greatly restricted unless terracing or other slope reducing methods are employed.
5. **Rugged to Very Rugged** (22° to 30°; 40% to 60%)
   Land which probably should not be cropped except in rare instances of soil particularly resistant to erosion. The use of farm machinery is precluded, and area should probably remain in permanent vegetative cover such as trees or grass.
6. **Extremely Rugged** (Over 30°; over 60%)
   Land which should be left in original natural vegetation.

   Note: Direction of slope to be shown with an arrow.

DRAINAGE (*Second Digit, Denominator*)

1. **Well Drained Land**
   Land which, in terms of drainage, does not normally present problems during planting, cultivating, or harvesting.
2. **Adequately Drained Land**
   Land which, in terms of drainage, does not normally present problems when used for agricultural production, but which under heavy rainfall conditions causes delays in farm operations and may result in lowered quality or reduced yield of farm commodities.
3. **Poorly Drained Land**
   Land which, in terms of drainage, is difficult to cultivate even during periods of normal rainfall, and which at least in part must be artificially drained.
4. **Very Poorly Drained Land**
   Swamp land which can be cultivated only if artificially drained.
5. **Excessively Drained Land**
   Land which, because of very steep slopes or extreme porosity, does not retain enough moisture to permit cultivation.
6. **Fields Flooded by Man**
   Land such as in rice paddies. When class 6 is indicated, a sub-denominator should be utilized to indicate drainage conditions during dry season or when flooding is terminated.

   Note: Drainage conditions should be mapped in terms of the current situation. If tiling or ditching is employed, a note to that effect should be recorded within the appropriate unit areas.

EROSION (*Third Digit, Denominator*)

1. **No Observable Erosion**
   Areas where soil erosion is negligible, or where soil formation is at least keeping pace with erosion.
2. **Little Erosion**
   Areas in which less than 25% of topsoil has been removed. The majority of erosion is sheet erosion, but a few small rills which offer no hindrance to cultivation may be present.
3. **Moderate Erosion**
   Areas in which 25% to 75% of the topsoil has been removed, primarily by sheet erosion although rills are more numerous than in Class 2.
4. **Severe Erosion**
   Areas with more than 75% of the topsoil eroded away, and up to 25% of subsoil removed. Rills are numerous and a few small gullies may be present. Gullies slightly impede cultivation.
5. **Very Severe Erosion**
   Areas with topsoil and more than 25% of subsoil removed. Gullies numerous and cultivation is impractical.
6. **Recent Alluvial or Colluvial Deposits**

STONINESS AND/OR ROCK OUTCROP (*Fourth Digit, Denominator*)

1. **No Stones**
2. **Moderately Stony**
   Scattered small stones causing little or no difficulty in cultivation.
3. **Stony**
   Characterized by stones sufficient in quantity and size as to create some cultivation problems.
4. **Very Stony**
   Covered with stones to such an extent that stones coat a larger area than soil, making cultivation impractical.
5. **Limited Rock Outcrop**
   Rock outcrops on from 1% to 10% of the total area.
6. **Considerable Rock Outcrop**
   Rock outcrops on from 11% to 30% of the total area.
7. **Great Rock Outcrop**
   Rock outcrops on from 31% to 50% of the total area.
8. **Rock Outcrop Barrens**
   Rock outcrops on more than 50% of the total area.

   Note: If both loose stone and rock outcrops are present, a secondary fraction is used with secondary numerator referring to stoniness and secondary denominator referring to rock outcrops.

SOILS (*Fifth Digit, Denominator*)

1. **Latosolic Soils**
   Usually some shade of red in surface color, grading down to reddish-yellow in the subsoil. Surface coarseness and subsoil compactness are typical. Iron and aluminum compounds abundant; organic content minimal; inherent fertility normally low.
2. **Tropical Podzolic Soils**
   Typically contain a small amount of unmixed humus on the surface. Upper horizon normally sandy and light in color. Inherent fertility normally low. Often marked by paucity of natural vegetation or by acid-tolerant plants.
3. **Margalitic Soils**
   Typically black or dark gray in the top horizon; usually with a basic pH. Lime concretions often present. Texture typically heavy; inherent fertility normally high.
4. **Hardpan and Claypan Soils**
   Variable surface color. Claypan or hardpan layer close to surface, which prohibits normal water percolation. Root penetration of the claypan or hardpan negligible. Upper horizons may be waterlogged soon after rains and become droughty quickly. Vegetation often scanty and semi-xerophytic. Little or no agricultural value.
5. **Limestone Soils**
   Frequently of reddish color and clayish texture. Often deep. Outside sources have probably added considerable mineral and/or organic matter. Inherent fertility high.
6. **Ando Soils**
   Dark brown to black top horizon, with good crumb structure and high quantities of organic matter. Lower horizons typically grade into a yellowish color. Generally derived from andesite. Inherent fertility good.
7. **Peat, Bog, or Marsh Soils**
   Very high in organic material, dark in color, waterlogged unless drained, often tight and clayey in lower horizons. Fertility high, if artificially drained.
8. **Loess or Windblown Sand**
9. **Alluvium**
10. **Lithosols**

CODE FOR LAND USE CHARACTERISTICS

1. CROPPED LAND (*First Digit, Numerator*)

Land from which crops, either individually or in combination, are harvested. **The second digit shall indicate the type of crop with a figure, or with a figure and a letter, for crop combinations.** Specific crops have not been enumerated because of the great variety found in different climatic environments. Figures should

be employed on the basis of frequency distribution of crops within a given region. **The third digit** shall be a quality symbol, with 1 indicating good, 2 suggesting average, and 3 poor. These quality symbols may be expressed in terms of weight or volume per unit area.

2. PASTURE OR HARVESTED FORAGE (*First Digit, Numerator*)

Land which is regularly or periodically used for grazing domestic animals or for production of forage, hay, or ensilage for animal feed.

1. **Natural Grass Pasture** (Second Digit)
   Native and/or degenerative grasses that show no human improvements.
2. **Rotation Pasture** (Second Digit)
   Alternately becomes cultivated land in an orderly sequence.
3. **Improved Pasture** (Second Digit)
   Grass shows evidence of improvement through mowing, fertilization, or seeding.
4. **Marsh Grass Pasture** (Second Digit)
   Marsh grasses used regularly or irregularly for grazing.
5. **Woodland, Brush, or Park Savanna Pasture** (Second Digit)
   Grass interrupted by scattered trees or brush.
6. **Harvested Forage** (Second Digit)
   Cropped land devoted to production of grass, hay, or ensilage for animal feed. (Quality symbol should be expressed in terms of yield per unit area.)

Pasture Quality Defined (Third Digit)

1. **Good** Less than 2 acres of grass required per animal unit per year.
2. **Fair** 2 to 4 acres of grass required per animal unit per year.
3. **Poor** 4 or more acres of grass required per animal unit per year.

3. FOREST AND BRUSH LAND (*First Digit, Numerator*)

Ungrazed natural or planted forest and brush lands.

1. **Selva** (Second Digit)
   Dense, frequently tri-storied, with a great variety of species, and minimal underbrush.
2. **Jungle** (Second Digit)
   Same as 1, above, except that underbrush is dense and land penetration difficult.
3. **Montane Rain Forest** (Second Digit)
   Forests misshapen because of severe climatic conditions.
4. **Tropical Deciduous or Semi-Deciduous Forest** (Second Digit)
   Some trees shed leaves seasonally.
5. **Mangrove Forest** (Second Digit)
6. **Brush** (Second Digit)
   Trees or shrubs less than 10 feet in height.

Forest Quality Defined (Third Digit)

1. **Good** In forest only: minimum diameter of most trees in excess of 10 inches at waist height, and tree cover close and continuous.
2. **Fair** In forest only: 25% to 50% of trees have minimum diameter of 10 inches at waist height, and tree cover relatively complete.
3. **Poor** In forest: less than 25% of trees have minimum diameter of 10 inches at waist height, and/or tree cover open. All brush should be mapped in this category.

4. NON-PRODUCTIVE LAND (*First Digit, Numerator*)

1. **Idle or Fallow Land** (Second Digit)
   Farmland not currently used, but showing evidence of previous use.
2. **Waste Land** (Second Digit)
   Unused land having little or no potential.
3. **Land Held for Planned Use** (Second Digit)

Note: Items in the landscape which occupy small areas, or which are largely urban in function, should be mapped by appropriate symbols. Where possible, standard map symbols should be employed.

° ° °

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(2) Jones, Clarence F., "The Rural Land Classification Program of Puerto Rico," *Northwestern University Studies in Geography, Number 1*, July, 1952, pp. 42-56. Dyer, Donald R., "The Pilot Study: The Development of Survey Techniques for the Rural Land Classification Program," *in* Jones, Clarence F. and Pico, Rafael (eds.), *Symposium on the Geography of Puerto Rico*, University of Puerto Rico Press, Rio Piedras, 1955, pp. 1-25.

THOUGHTS ON READING APPLICATIONS FOR GRANTS IN GEOGRAPHY

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University of Massachusetts

IT HAS BEEN the author's privilege to serve for some years on two panels reviewing applications for foreign study and research by American geographers. Work on these panels is performed solely from a sense of duty to the profession. It is this same sense of duty which prompts these remarks. Perhaps the writer is too close to the subject to be objective, but he is going to state his impressions anyway.

By and large one is appalled by the poor quality of many of the applicants and the poor form of their applications. The pitiful strivings for respectability as scientists and research workers on the part of a significant number of the applicants is saddening. We as geographers should take pride and joy in our profession. It certainly is to be hoped that there are many geographers who do not apply for one reason or another; it would be discouraging to think that those applying were the average of our profession.

To be specific, many applicants appear not to have read the list of qualifications necessary for appointment. Occasionally they have not taken any courses in the field of geography, and yet expect to be able to teach it abroad. For geographers with a master's degree from undistinguished departments or schools, and who have done no subsequent independent study or research, to apply for a professorship at one of the great foreign universities is due either to arrogance or, one trusts, to a lack of reading of the fine print that says a Ph.D. or its equivalent is desired.

In the mechanics of preparing applications, sloppiness often is evident. Basic biographical data are inadequately furnished on about every application. Knowing that the application is going to be read by from five to ten other persons should prompt an applicant to at least re-read his application and to see that blanks are filled in, figures add up correctly, and that words and common geographical place names are spelled correctly.

Another weakness on the part of applicants is their failure to use the basic geographic knowledge they must possess. For example, one geographer planned to attend classes and seminars and yet do intensive research in the heart of Africa; during his year there he was, also, planning to travel 30,000 miles by private car at a cost of three cents a mile. This is reconnaissance geography at its worst and shows a real ignorance of the economic, transportation, and educational facts of life. Often there is evident a lack of knowledge of the state of the geographic profession in the country for which application is made. Applicants should know that the Association of Japanese Geographers has almost the same number of members with the same degree of training as the AAG; the literature of Japan is full of detailed urban studies; Japanese geographers know and use more advanced statistical methods in their research than do average American geographers.

The writer's major criticism, however, lies in the lack of understanding on the part of far too many applicants as to the nature of geographic research. It is fortunate that, generally, non-geographers are not involved in the screening process, for they would gain a poor opinion of our research processes and training. An applicant who is going to "live close to the natives" in a tribal area in Africa, is not, thereby, doing geographic research. Taking colored pictures for use in classes is fine for the traveling geography teacher, but it should not be called research. Geographic research requires a specific manageable plan of action that answers the questions Where? Why? and So What? The statement of the research problem must relate the problem to the total field of geography. Its significance and importance must be evident to the casual reader of the application and not solely to the applicant.

Though it should be related to the field, the problem should not encompass the whole field. Why, in the span of a few months, should a geographer proposed to study in the field all of the industries of a large continent and yet term his work research? Let him realize that he is only going to write a superficial paper or book about this subject, or use his observations to brighten his class lectures; he cannot call this geographic research.

A final note of adverse criticism, this time addressed to those who write supporting letters rather than the applicants. Some geographers are notorious in writing platitudes about every student or fellow geographer they recommend. A well-phrased, honestly-worded brief statement carries tremendous weight amidst the litter of high-sounding verbiage within a folder. Geographers, and departments and schools of geography, are critically judged by the letters they write about other geographers or their students.

Airing grievances can do little good unless they are followed by constructive suggestions. We need more and better applications from more and better geographers if we want to keep and, more importantly, expand the offerings for geographers under the Fulbright, ONR, National Academy of Sciences, Ford Foundation, and other programs. There are numerous excellent opportunities for foreign study, but geographers as a group will not be considered for them unless we present better candidates than is now the case. Sometimes stipends are too low or are in unconvertible currencies, but surely an ingenious and active geographer can work out a combination of grants if he feels that it is important to carry on research, study, and service abroad.

To be more specific in his suggestions, the writer would recommend the following. (1) The AAG should publicize widely the opportunities for work abroad. (2) Departments of geography should set up interdepartmental stimulating and screening committees or panels, so that well-qualified, well-presented applications from students and alumni will be forthcoming. (3) Departments of geography and geographers who furnish supporting statements should give meaningful evaluations. Finally, (4) geographers completing applications should remember that not only they as individuals, but the schools which they have attended and the whole geographic profession, are being judged, and hence their applications should be carefully and intelligently presented.

THE CORIOLIS BUGABOO

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PROBABLY at no point in the presentation of physical geography is more awkwardness encountered than at the introduction of that "force" produced by rotation of the earth. Ferrel's law or the Coriolis force is continually invoked in our explanation of the general and secondary circulations of the atmosphere; yet, fundamental expositions of its cause are almost universally omitted both from classroom teaching and textbooks. Three reasons appear to exist for avoiding the subject: first, most elementary students fail to understand it even if accurately and clearly presented; second, graphic portrayal of the problem is admittedly difficult; last, for many geographers this force is enveloped in a haze of half-truth and misunderstanding.

Inquiring minds, not content with the pat statement of this force's existence, ask "why." It is not being suggested that development of the Coriolis acceleration parameter be included in geography texts, but it is hoped that through this article some misconceptions which surround it can be eliminated and a reference provided which does not depend on mathematics or physics beyond the first year college level.

Newton, in the statement of his first law of motion, said that ". . . a body in motion will continue in motion in a straight line

unless acted upon by some external force." He did not say a straight line on the earth's surface. This is the crux of the Coriolis problem. Air moving in response only to pressure differences has no other urge than to move in a straight line in terms of space coordinates. Air should not be accused of breaking Newton's law simply because it fails to observe linearity of motion with reference to coordinates which are in rotation. At the poles this paradox is easily comprehended and is so frequently illustrated in existing literature that it will be omitted here. At the equator, however, rotation about an axis is absent (Fig. 1). Successive

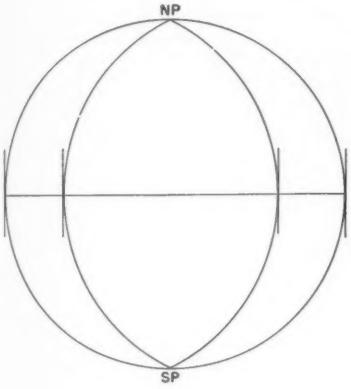

FIG. 1

positions of a north-south tangent line are parallel to each other. Certainly meridians pass beneath the path of the moving air, but they are not rotating about a vertical axis through the tangent line. Thus, there is no deviating force.

The polar and equatorial cases illustrate the two types of motion that any plane tangent to the earth can undergo. At the poles a pure rotation holds, whereas at the equator the only motion is one in which the plane is tilted about the earth's axis. Planes at intermediate latitudes exhibit some of each type of motion (Fig. 2). The tilting movement is vertical and can be disregarded because it has no effect in a consideration of horizontal forces.

That rotation exists at intermediate latitudes can be demonstrated, graphically, without difficulty. In Figure 3, let A and B

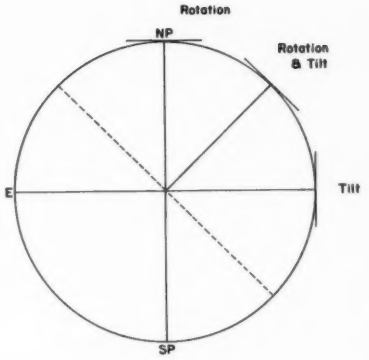

FIG. 2

represent two points on parallel LL'. C is the center of the earth and O is the center of parallel LL'. AT and BT are north-south lines tangent at A and B and intersecting the earth's axis extended at point T. The change in direction as point A moves to B is the angle ATB. If $\curvearrowright$ designates the angular velocity of tangent line AT, and t designates time, then

$$\curvearrowright t = \angle ATB \qquad (1)$$

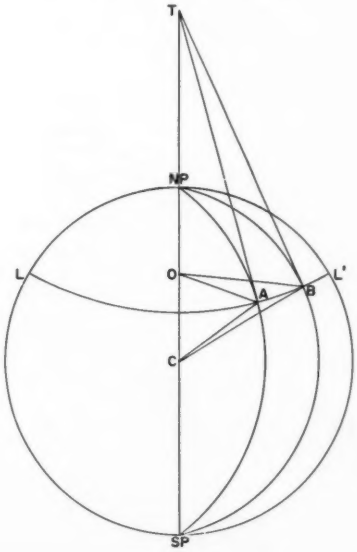

FIG. 3

and if ω is the angular velocity of the earth, or the angular velocity of OA, then

$$\omega t = \angle AOB \qquad (2)$$

From (1) $t = \frac{\angle ATB}{\frown}$; and from (2) $t = \frac{\angle AOB}{\omega}$

Equating these expressions for t

$$\frac{\angle ATB}{\frown} = \frac{\angle AOB}{\omega}$$

and solving for $\frown$ we have

$$\frown = \frac{\angle ATB}{\angle AOB} \cdot \omega$$

Now $\angle ATB$ may be represented by $\frac{AB}{AT}$ since the angle is small, and $\angle AOB$ may be represented by $\frac{AB}{AO}$ for the same reason.

The ratio of the first to the second is $\frac{AO}{AT}$ and this is sin $\angle OTA$ which is, of course, the latitude of A. Therefore a plane tangent to the earth, or any portion of the earth's surface, undergoes a rotation whose speed is the product of the earth's angular velocity and sin ϕ, where ϕ is the latitude.

At 90° latitude sin ϕ is 1, so rotation of the tangent plane is the same as that of the earth; whereas at 0° latitude the sin ϕ is 0, and the Coriolis force is nonexistent. At intermediate latitudes, intermediate rotational speeds occur. If such rotation cannot be acknowledged either intuitively or from the preceding trigonometry, then it is useless to read further.

To complete the development of the Coriolis term, an additional step is necessary. Consider the rectangle of Figure 4 to be a small portion of the earth's surface rotating in its own plane about R so that in time, t, A moves to B. The angle turned through in time, t, is $\angle ARB$ so,

$$\angle ARB = t\,\omega \sin \phi$$

If air has moved from R to A during this time interval then the distance RA can be expressed as

$$RA = vt$$

where v is the linear velocity of the air.

If the arc distance AB be called S then

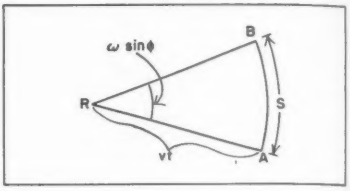

FIG. 4

$$S = (AR) \cdot (\angle ARB)$$

based on the fact that arc distance is equal to the product of central angle and radius.

Now, substituting vt for distance AR, and t ω sin ϕ for the $\angle ARB$, we have

$$S = (vt)\ t\ \omega \sin \phi$$
$$= vt^2\ \omega \sin \phi$$

Substituting this in the familiar formula relating distance to acceleration and time gives

$$S = \tfrac{1}{2}\, a\, t^2$$

and solving for a, we have

$$a = 2\ v\ \omega \sin \phi$$

which is the Coriolis acceleration. The only variable quantities are the linear velocity of the air and the latitude. A point of confusion sometimes arises about air moving due east or west. The acceleration expression derived above, it should be noted, is completely independent of direction.

The geographer cannot be expected to derive the Coriolis acceleration term for his class, but certain points can be clarified.

(1) This apparent force is due to rotation of any segment of the earth's surface about its own vertical axis.

(2) Rotation takes place at all latitudes except 0.

(3) Rotation is at a maximum at the poles and diminishes equatorward as the sin of latitude.

(4) Direction of motion has absolutely no effect on the Coriolis acceleration.

(5) The direction of this force is always at right angles to the instantaneous direction of the air, directed toward the right in the northern hemisphere and toward the left in the southern.

SALARIES OF GEOGRAPHERS IN THE UNIVERSITIES

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THE ACCOMPANYING table showing the range of salaries and the average salary for each of the four ranks of instructor, assistant professor, associate professor, and professor represents a partial but representative inventory of the salary scales in effect in 16 universities across the country (Table 1). The inquiry about salaries was undertaken to determine first of all the position of a single department in relation to the scale in departments of geography in other institutions of comparable standing. After the schedules of some five or six departments had been received the project was expanded to include 20 departments in order to determine to what extent salaries are comparable and to what extent there are significant differences, especially at the different ranks. There was some reluctance to supply all of the information sought. Four chairmen reported that they were not permitted by their respective universities to release information about salaries. In most cases the information was supplied promptly and generously. It is well known that among universities there are leaders in respect to the salary scale. Others are clearly the followers for the reason that funds always seem to be a little short of the amount required to establish a satisfactory scale. There are also the trailers where the appropriated funds or the income on the endowment and other sources are so low in terms of need that administrative officers and faculty alike despair of ever receiving salaries comparable to those in the leading universities. Any major shifting among these three groups usually is a slow process but changes in the ranking of universities and of departments on the matter of salaries are known to the administrative officers who are concerned with salary problems.

After the information had been obtained it was arranged in such a manner as to conceal the identity of the individual departments. The salary of any individual in a department is such a personal matter that the revealing of anyone's salary is unintended. The unusually curious may be able to identify a particular department and by further speculation determine what he thinks is the salary of a particular staff member. The data presented are for the academic year, 1959-1960. By the time the information is in print, budgets for 1960-1961 will have been completed and many individual salaries will soon be adjusted upward. To the extent that identification is possible it is hoped that the benefits derived from publication may offset any personal embarrassment. It is very important from the standpoint of future studies of salary scales that the schedule for the year, 1959-1960, be published and established as a base for further improvement of salary standards of geographers in the universities.

The data are largely self-explanatory and require little elaboration. It is obvious that the rank of instructor is used sparingly and probably for persons who have not completed the requirements for the Ph.D. degree. The assistant professor grade represents the starting rank for the fully trained geographer. The initial salary is usually $6,000 or above, and the appointee can expect to attain a salary of $7,000 before he is advanced to associate professor. At this latter rank the starting salary will probably be a little under $8,000 and may be as low as $7,000. The average salary while in this rank is currently approximately $8,360 and the maximum he is likely to attain before being advanced to professor will be approximately $9,000 depending upon the department. The minimum salary for professors is likely to be above $9,000; the average will be close to $11,000 to $12,000; and the maximum may reach $14,000 or $15,000 depending upon the institution and the distinction of the individual faculty member.

The young geographer who begins his professional career at the rank of assistant professor and at a salary ranging from $6,000 to $7,000 is greatly interested in

TABLE 1

DEPARTMENTS OF GEOGRAPHY*

RANGE OF SALARY

University	*Instructor*	*Assistant Professor*	*Associate Professor*	*Professor*
A	$5,196-	$6,396-$6,696	$7,392-$7,704	$9,372-$12,672
B	$5,800-	$6,800-	$8,500-$9,000	$10,800-$13,000
C	none	$5,600-$6,000	$9,000-	$10,000-$13,000
D	not provided	not provided	not provided	not provided
E	none	$7,100-	$8,000-$8,900	$9,800-$14,300
F	not provided	not provided	$6,390-$10,503	$8,253-$12,609
G	none	$6,600-$7,000	none	$10,800-$11,250
H	$5,496-$5,916	$6,516-$7,536	$8,316-$9,612	$10,860-$14,200
I	none	$6,300-$7,000	$9,100-	$10,200-$15,000
J	$5,400-(Lecturer)	$6,300-$6,930	$7,200-$7,560	$8,280-$9,000
K	$5,200-$5,700	$6,200-$6,800	$7,200-$8,500	$8,700-$10,800
L	$4,000-$5,600	$5,000-$7,500	$6,500-$9,000	$8,000-$14,000
M	none	not provided	not provided	not provided
N	$5,500-	none	$7,000-	$8,916-$14,350
O	none	$6,500-$7,000	$9,000-	$10,000-$15,500
P	none	$7,200-$7,488	$7,776-$10,080	$11,232-$12,096

AVERAGE SALARIES

University	*Instructor*	*Assistant Professor*	*Associate Professor*	*Professor*
A	$5,196	$6,471	$7,500	$10,147
B	$5,800	$6,800	$8,750	$12,275
C	not provided	$5,800	$9,000	$12,000
D	none	$6,500	$7,960	$11,610
E	none	$7,100	$8,320	$11,220
F	not provided	not provided	$8,400	$10,989
G	none	$6,733	none	$11,025
H	$5,916	$7,140	$8,956	$13,111
I	none	$6,600	$9,100	$12,215
J	$5,400	$6,585	$7,380	$8,760
K	not provided	not provided	not provided	not provided
L	not provided	not provided	not provided	not provided
M	none	not provided	$8,400	$11,350
N	$5,500	none	$7,000	$10,942
O	none	$6,666	$9,000	$12,700
P	none	$7,392	$8,640	$11,664

A The teacher contributes 7 per cent of his gross salary to the State Teachers Retirement System and the University contributes 10.41 per cent of the salary budget to the System.

B Members of the faculty contribute 5 per cent of their salary toward the retirement plan. Under the TIAA plan the University contributes 10 per cent.

C The University contributes 9 per cent of the teacher's salary toward a TIAA annuity.
D Extras related to retirement not reported.
E Extras related to retirement not reported.
F University on a combination TIAA-Social Security retirement plan with each contributing 7½ per cent of the individual's annual salary.
G Subject to a 3 1/3 per cent deduction for TIAA (University contributes 6 2/3 per cent).
H Individual staff members contribute to the retirement system. The rate depends on the age of the staff member when he enters the employment of the University. The University contributes 9.16 per cent.
I Members of the staff contribute 5 per cent to TIAA. The University contributes 10 per cent.
J Members of the staff contribute 7 per cent of their salary.
K Members of the faculty contribute 5 per cent of gross salary under TIAA plan and the University matches this amount.
L Employees contribute 3 per cent of first $4,800 and 5 per cent on excess of $4,800. University contributes approximately $2.00 per dollar contributed by employee.
M Extras related to retirement not reported.
N University System: non-contributory, one-third of maximum five-year average, including summer school. Social Security: usual arrangement, additional to above.
O Members of the faculty contribute 5 per cent and the University contributes 10 per cent to the TIAA retirement plan.
P University contributes an average of $674 per year for retirement and hospitalization. The individual's contribution depends on the age of the staff member when he is employed by the University.

* The departments listed in this table are arranged in a random array in order to avoid identification. The universities represented include: Syracuse, Illinois, Washington, Northwestern, Indiana, Ohio State, Wisconsin, Iowa, Boston, Louisiana State, Chicago, Michigan, Pennsylvania State, U.C.L.A., Southern Illinois, and Utah.

the salary scale of the department he joins. The policy of the department in respect to salary increases and advances in rank may affect greatly the morale of the staff and the general academic strength of the department. In the field of education as well as in labor unions the so-called fringe benefits have become increasingly important in the total salary package. As much as one may deplore the detailed inquiries of 30-year old applicants about the retirement system it is entirely proper that the applicant seeking a new position be given a complete statement about his total wage, his take-home pay, and the fringe benefits to which he is entitled.

Range of salaries. In principle the range between the low or starting salary and the top salary of any rank should be great enough to permit substantial salary advances or adjustments within the grade. Occasionally we hear of a situation where a promotion is made before the faculty member satisfies fully the standards for advancement because it became necessary to give him a salary increase to meet a competitive offer. Under such conditions it is useful to have overlapping ranges. This makes it possible for the department and the university to avoid a tight and exact relationship between ranks and salaries. The scholarly requirements of the individual grades, particularly those of associate professor and professor, can be strictly observed when the higher salaries of one rank may be above the lower salaries of the next higher rank. From the data reported it is clear that this situation exists not only in principle but in practice as well.

Increase in salaries. In 1948 George F. Deasy in an article entitled "The Geographer's Salary" (*1*) reported the following salaries: instructor about $3,500, assistant professor about $4,000, associate professor about $4,500, and professor about $5,500. He did point out that certain individuals, depending upon age and other factors, enjoyed salaries of $7,000, $8,000, $9,000, or as much as $12,000 which seemed to be the existing ceiling.

Six years later Andrew H. Clark writing on "Careers for Geographers in Higher Education" (2) reported that instructors received $4,000, assistant professors $5,000, associate professors $5,800, and professors $7,500. The gain ranged from $500 for instructors to $2,000 for professors. Clark made no reference to professors who were receiving the higher salaries in 1948 but the chief administrative officer of any large department of geography knows that these salaries were increased $1,000, $2,000, or even more depending upon the age and the claims of the individual faculty members for salary increments.

The data on salary schedules for 1959-1960 show that the scale has continued to increase. Again, after another interval of six or seven years, instructors receive from $5,000 to $5,800, a substantial increase over the average of $4,000 reported by Clark. At the higher ranks the new salary levels are from $1,000 to $4,000 above the average salaries shown in Clark's table. In individual cases the actual increases may be much greater because the staff member has enjoyed an increase related to a promotion in rank and the improvement in the scale within a particular grade.

An individual case. A mature and accomplished associate professor was advanced to professor in 1950 at a salary of $6,072. Over a period of ten years his salary has been increased to $10,272. This is equivalent to an average annual increase of a little more than $450. This represents the application of an assemblage of factors. One of the most important factors has been the operation of a changing salary scale for the rank of professor. Also represented in the overall increase are upward adjustments in recognition of his worth to the department and the university. In this period there was one across-the-board increase of $300 representing a cost-of-living adjustment. Over this ten-year period increases have been given to one-third to one-half of the staff each year. In two or three years all members of the department received salary increases equivalent to $300 to $500 per year depending upon the person and individual circumstances.

Some concluding comments. The subject of salaries deserves extended treatment but the reader is reasonably familiar with many of the problems that confront the university teacher, the chairman of the department, and the administrative officers of the university. In the present market, paying-off-in-rank is a familiar practice and many young geographers faced with rising living costs have accepted positions where they could obtain a reasonably good starting salary. In some universities and colleges the salaries at the associate professor and professor ranks may be $2,000 or more below the salary levels of the leading universities. Teaching loads vary enough to make a significant difference in the chance of becoming a productive scholar or a slave to the routine of the classroom. The fringe benefits collectively when considered with the salary may make the difference between an attractive opportunity and a job. By every means available geographers and other university personnel must make a sincere and continuing effort to raise the status of the university teacher and scholar. Substantial and repeated increments to the salary will do much to improve the situation.

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(1) Deasy, G. F., "The Geographer's Salary," *The Professional Geographer*, Vol. 8 (Old Series), December, 1948, pp. 4-16.

(2) Clark, A. H., "Careers for Geographers in Higher Education," *The Professional Geographer*, Vol. VI, No. 3, May, 1954, pp. 19-28.

ASSOCIATION AFFAIRS

ACTIONS OF THE AAG COUNCIL, DALLAS, APRIL 17, 1960

(LAST MEETING, 1959-60 COUNCIL)

The meeting was called to order by President Paul A. Siple at 10:00 a.m. All members were present except Lester Klimm, G. Etzel Pearcy, and representation from the Pacific Coast, East Lakes, and New England divisions. Guests present were Phyllis Griess and Meredith Burrill.

1. Results of mail ballots during the Association Year were summarized by the Secretary. Some minor corrections were made in the minutes for the Pittsburgh meeting. The Saxony Hotel was approved as headquarters for the Annual Meeting at Miami Beach, April 22-26, 1962. The proposed special issue of the *Annals* for the International Geographical Congress was cancelled. A grant of $250 from the General Research Fund was approved for John Wesley Coulter. A number of committee appointments and chairmanships were confirmed. Among the more important were the Program Committee for the Annual Meeting at East Lansing, Aug. 28 - Sept. 1, 1961 (Eugene Cotton Mather, Chairman, Ross Mackay, Arthur Robinson, Lawrence Sommers, and Wilbur Zelinsky), and a Committee on Local Arrangements for that meeting (Lawrence Sommers, Chairman, Charles Boas, Dieter Brunnschweiler, Paul Morrison, Allen Philbrick, Edward Prophet, and Clarence Vinge).

2. The Honors Committee awarded certificates for Meritorious Contributions to William Garrison and David Lowenthal, Outstanding Achievement Awards to Richard Hartshorne and Richard Joel Russell, and designated C. Warren Thornthwaite as Honorary President for 1960-61.

3. The Tellers Committee for the national election reported that for 1960-61 Jan O. M. Broek will be President and Gilbert F. White Vice President. Meredith F. Burrill was elected Secretary for three years, and James Parsons and Arthur Robinson were elected new Councilors.

4. A delegation of six American geographers was named to study the status and application of various aspects of geography in the U.S.S.R. next September in exchange for six Russian geographers who will take a comparable tour in the U.S. this June. The exchange is financed by the National Science Foundation and approved by the Department of State. The U.S. Delegates are to be Chauncy Harris, Chairman, Richard Hartshorne, Charles Hitchcock, William Horbally, Richard Joel Russell, and Gilbert White.

5. The Treasurer presented a detailed analysis of the Association's financial transactions during 1959, ending with the good news that income exceeded expenditures by $4,096.09 and that the net worth of the Association on Dec. 31, 1959 was $41,558.93.

6. In accordance with recommendations from the Publications Committee the Council approved a new publication to be known as *Proceedings of Annual Meetings of the AAG* and to be established as soon as practical; set the term for Editor of the Monograph Series at three years and reappointed Andrew Clark for another term; authorized the Editor of the Monograph Series to consider manuscripts derived from doctoral dissertations for possible publication in the Monograph Series; agreed to complimentary distribution of a sample of *The Professional Geographer* to *Annals* subscribers at the discretion of the *P.G.* Editor and AAG Secretary; and instructed the Secretary to express the appreciation of the Association to Evelyn Pruitt and Norton Ginsburg for past editorial services. The present Editor of *The Professional Geographer* was complimented on the improved format and low cost of the publication this year.

7. A new *Handbook-Directory* was approved for publication by letterpress in the

P.G. format during 1960, with a recommendation that every effort be made to have sample copies for exhibit at the International Geographical Congress in August. Publication of a new report on the *Status and Trends of Geography in the U.S.* was approved in principle as a supplement to *The Professional Geographer.*

8. An agenda for the Annual Business Meeting was approved, including nominees for the Association's elected committees: Credentials, Honors, and Nominating.

9. The Secretary reported on personnel, equipment, and space problems of the Central Office, and the President interjected some comments on the need for a paid Executive Secretary even if the costs have to be financed by capital reserves until such time as the Executive Secretary could pay his own way by obtaining research contracts, foundation support, and larger membership. No action was taken.

10. Recommendations from the Committee on Constitution and By-Laws were approved to the effect that there be no change in the term of office for the Treasurer, and that family memberships be interpreted to mean husband and wife relationships only. A recommendation that Regional Chairmen unable to attend an Annual Meeting be represented by voting proxies was remanded to the new Council for preparation of an appropriate amendment to the Constitution. A merger of the New York-Ontario and the New York Metropolitan divisions into a New York-New Jersey Division was approved with a recommendation that the boundary aspirations of the new Division to include all of New Jersey be referred to the Committee on Regional Divisions.

11. In addition to the research grant to John Wesley Coulter approved by mail ballot, grants from the General Research Fund were made to Thomas P. Field ($450) and Henry M. Kendall ($500).

12. The Secretary was authorized to dispose of several damaged copies of *American Geography – Inventory and Prospect* at his discretion.

13. A formal Council action establishing March 1-10 for allocating funds and distributing membership lists to Regional Divisions was modified to the more practical dates of April 10-20.

14. C. Wallace Dierickx reviewed requirements of the Chicago school system for from 100 to 200 geography teachers, and the Joint Committee on Education (AAG and NCGE) was asked to draft an appropriate statement of the need for geography teachers and recommendations for remedying the shortage.

15. The Secretary was asked to compile a list of benefits received by the AAG during the past year from commercial concerns, societies, foundations, and individuals, with a view toward expressing appropriate appreciation.

16. A discount of 30 per cent on *P.G.* subscriptions for chapters of the honorary geographical fraternity, Gamma Theta Upsilon, was approved.

17. The President recommended that local certificates and national plaques be granted by the AAG as minimum awards at Science Fairs, and that additional awards be made to schools if possible. He indicated that it would be desirable to encourage projects in geography by bringing the winners of national awards to Annual Meetings or granting substantial cash awards. Action was deferred to the new Council.

18. A request from the Southeastern Division for an extra 25 cents per member because of expenses in connection with the Division's Yearbook was approved.

19. A copy of the report from the Committee on Geographers in Business was given to each Council member for study prior to consideration by the new Council of reimbursing the Chairman for reproduction costs, and further use to be made of data from questionnaires circulated by the Committee.

After referring several items of unfinished business to the new Council, the meeting adjourned at 7:40 p.m.

Arch C. Gerlach, Secretary

ACTIONS OF THE AAG COUNCIL, DALLAS, APRIL 20, 1960

(FIRST MEETING, 1960-61 COUNCIL)

The meeting was called to order by President Jan O. M. Broek at 11:53 a.m. All members were present or represented except Howard Gregor, James Parsons, G. Etzel Pearcy, and John Lounsbury. Guests present were Arch Gerlach and Phyllis Griess. The following actions were taken by the Council:

1. Elected an Executive Committee consisting of the four officers, the immediate past President, and Councilors G. Etzel Pearcy and Fred B. Kniffen.

2. Adopted a budget for 1960-61.

3. Recommended to the 1961 Program Committee that any welcoming session be reduced to a minimum and that sessions of papers be scheduled for the first forenoon.

4. Shifted the date of the Denver meeting to September 1-5, 1963 to avoid a noncentral meeting place in an International Geographical Congress year (1964), and accepted invitations to meet in Syracuse, New York in April 1964 and in Columbus, Ohio in April 1965.

5. Reappointed Edwin H. Hammond and John E. Brush to the Editorial Board of the *Annals*.

6. Designated Richard J. Russell as Chairman of the Editorial Board of the Monograph Series and appointed Lester E. Klimm as a member to succeed Stephen B. Jones, whose term expired this year.

7. Named George F. Deasy to be Associate Editor of *The Professional Geographer*.

8. Reappointed Richard E. Harrison as Map Supplement Editor of the *Annals*.

9. Authorized the Education Committee (joint with NCGE) to proceed with negotiations for support of a high school geography program using TV tape.

10. Deferred for study an extensive report entitled *The Nontraditional Jobs of Geographers* prepared by the Committee on Geographers in Business.

11. Appointed committee chairmen and members. The list will be published as soon as acceptances have been received.

12. Provided that the Treasurer shall be a member of the Finance Committee. Assigned to that Committee responsibility for recommending general investment policy to the Council and for management of the portfolio of securities in accordance with Council-approved policy.

13. The President suggested that appointments to committees warranted more careful study than is usually possible in Council meetings. The Executive Committee will look into possible procedures that might help to accomplish this.

14. Appointed an ad hoc committee on relations of the Association with the Canadian Association of Geographers.

15. Requested the Secretary to forward to the Department of State the names of members who plan to be abroad and might appropriately be asked to give lectures if an occasion arises.

16. Deferred action on National Science Foundation graduate record examinations, pending receipt of additional information.

17. Instructed the Secretary to inquire into the possibility of a grant for distribution of the *Annals* to libraries in Asia.

18. Approved a recommendation by the Constitution and By-Laws Committee that a division chairman unable to attend a Council meeting be empowered to appoint a proxy to represent the division with the right to vote. A constitutional amendment to this effect will be submitted to the membership.

There being no further business the Council adjourned at 2:00 a.m., April 21, 1960.

Meredith F. Burrill, Secretary

AAG BUSINESS MEETING, DALLAS, APRIL 20, 1960

President Paul A. Siple opened the meeting at 4:50 p.m. with approximately 100 members present, and adjourned the meeting at 6:20 p.m. He directed the distribution of agenda sheets and ballots presenting the Council's nominees (two for each vacancy) for the Association's elected committees. Since no additional nominations were made from the floor, he appointed a Tellers Committee to collect and tabulate the ballots.

In his report for the Association Year, President Siple emphasized the problem of obtaining geography teachers for secondary schools, the need for good teachers in introductory courses to attract capable students into the profession, the desirability of more service to the public by geographers, more service to national leaders, and the utility of an improved statement of geography as a science.

The Treasurer, George F. Deasy, distributed a one page summary of the Association's financial status, showing a net excess of income over expenditures of $4,096.09. In reviewing the fiscal affairs of the organization, he stated that approximately one-half of the 1959 income, excluding custodial income, was derived from sources other than dues, i.e., income from the *Annals*, *The Professional Geographer*, the sale of special publications, profits from the annual meeting, dividends and interest, and donations. The Treasurer also stated that approximately one-third of the 1959 expenditures was used to maintain the Central Office, another one-third was needed to publish the *Annals*, about one-tenth was used to produce *The Professional Geographer*, another one-tenth was given to members in grants, and the small remainder financed the activities of committees, regional divisions, and officers.

The retiring Secretary, Arch C. Gerlach, thanked the officers and Association members for their assistance during the past three years. He said that the Association's business is accomplished mainly through the work of individuals, through their cooperative effort on projects, and through the activities of AAG committees. More than 150 members served on more than 30 committees during the Association Year, with especially notable results being achieved by the committees on Placement, Geographers in Business, Status and Trends in Geography, and by the Program and Local Arrangements committees. The Secretary stressed also the need for an adequate, competent, and experienced staff in the Central Office where between 240 and 360 pieces of mail are handled each week.

The membership stood for a moment of silence in honor of six deceased members whose names were read by the President.

The Tellers Committee reported that Elaine Bjorklund was elected for a three-year term on the Credentials Committee (Clarence Olmstead and Robert Harper being continuing members); Stephen Jones, Chairman, Edwin Foscue, and Preston James were elected to the Honors Committee; and Lester Klimm, Chairman, Richard Logan, and Joseph Russell were elected to the Nominating Committee.

Alfred Meyer presented the report of the Temporary Committee on Programs in the absence of the Committee Chairman. The report summarized viewpoints on time of meetings, length of meetings, and the character of programs, including invited papers, unlimited sessions, screened papers, panel discussions, and field trips. The report did not offer recommendations. It was referred to the Executive Committee for further consideration and possible use in drafting a guide for the 1960-61 Program Committee.

The Secretary announced that copies of the new *Directory of College Geography of the United States* may be purchased by AAG members for 50 cents from J. R. Schwendeman, University of Kentucky.

President Siple called for volunteers to serve on AAG committees during the coming year.

Arch C. Gerlach, Secretary

TREASURER'S REPORT

Submitted herewith are statements detailing fiscal operations of the Association of American Geographers during the period January 1, 1959 to December 31, 1959, together with an analysis of the comparative year-end financial situation of the organization during the period 1957-1959. The data are self-explanatory. Additional details on financial aspects of the Association may be obtained from the Treasurer.

The assistance so willingly rendered by the Secretary, the Central Office staff, and the bookkeeper-auditor is acknowledged with deep appreciation. Without their help, the chores of the Treasurership would have been much more burdensome.

George F. Deasy, Treasurer

RECEIPTS AND DISBURSEMENTS

January 1, 1959 to December 31, 1959

PART I – NORMAL OPERATIONS

A. *Income*			
1. Dues		26,185.75	
2. Income from Regular Periodical Publications			
Annals	11,215.92		
Professional Geographer	2,863.63		
		14,079.55	
3. Income from Securities and Bank Interest Credited to Annals Support Fund (½ total)		1,310.25	
4. Other Income from Normal Operations			
Annual Meeting	2,143.33		
Other (including Central Office services)	953.17		
		3,096.50	
Total			$44,672.05
B. *Expenditures*			
1. Administration			
Central Office (*Schedule A*)	16,892.94		
Officers	1,991.10		
Regional Divisions	991.30		
Committees	2,073.50		
Miscellaneous	70.13		
		22,018.97	
2. Regular Publications			
Annals	15,254.40		
Professional Geographer	5,016.88		
		20,271.28	
Total			$42,290.25
Excess of income from normal operations over related expenditures			$ 2,381.80

PART II – SPECIAL ACTIVITIES, EXCEPT CUSTODIAL

A. *Income*

1. Sale of Special Publications			
Nature of Geography	1,043.15		
American Geography	1,270.97		
Handbook-Directory (1956)	64.25		
		2,378.37	
2. Income from Securities and Bank Interest Credited to:			
Atwood Research Fund (¼ total)	655.12		
General Research Fund (¼ total)	655.12		
		1,310.24	
3. Donations Received			
Nystrom Fellowship Fund	2,400.00		
Administration of Nystrom Fellowship Fund	400.00		
		2,800.00	
Total			$6,488.61

B. *Expenditures*

1. Research Grants			
Atwood Research Fund	1,000.00		
General Research Fund	1,000.00		
Nystrom Fellowship Fund	2,400.00		
		4,400.00	
2. Charges Against Non-Serial Publications Fund		116.50	
3. Special Publications			
Nature of Geography	57.82		
Monograph Editorial Expenses	200.00		
		257.82	
Total			$4,774.32
Excess of income from special activities, except custodial, over related expenditures			$1,714.29

PART III – CUSTODIAL ACTIVITIES

A. *Income*

1. National Science Foundation Grant No. 10309 for an "Evaluation of the Soviet Research and Training Programs in Geography" by C. D. Harris and associates, monies for which are placed in the custody of the Association	$15,500.00
B. *Expenditures*	0.00
Excess of income from custodial activities over related expenditures	$15,500.00

PART IV – SUMMARY

A. *Income*			
1. Normal Operations	44,672.05		
2. Special Activities, Except Custodial	6,488.61		
3. Custodial Activities	15,500.00		
			$66,660.66
B. *Expenditures*			
1. Normal Operations	42,290.25		
2. Special Activities, Except Custodial	4,774.32		
3. Custodial Activities	0.00		
		47,064.57	
C. *Deferred Credit*			
1. Custodial Activities		15,500.00	
D. *Excess of Income Over Expenditures*			
1. Normal Operations	2,381.80		
2. Special Activities, Except Custodial	1,714.29		
		4,096.09	
			$66,660.66

SCHEDULE A – ANALYSIS OF CENTRAL OFFICE EXPENDITURES

Gross Wages	$ 9,835.10
Social Security Taxes (Employer)	244.70
Rent	759.00
Equipment and Furniture	1,803.38
Equipment Rental and Service	66.52
Supplies	1,435.08
Postage and Stamped Envelopes	1,878.23
Accounting and Bookkeeping Services	304.00
Moving Expenses	40.45
Workmen's Compensation Insurance	20.80
Fire and Extended Coverage Insurance	10.00
Central Office Expenses in Connection With Annual Meeting	102.50
Miscellaneous and Petty Cash	393.18
	$16,892.94

COMPARATIVE BALANCE SHEET

(Excluding Custodial Activities)
December 31, 1957, 1958, 1959

ASSETS *(1)*	1957	1958	1959
Cash (Checking Account)	$10,480.99	$ 2,780.24	$ 4,153.52
Cash (Savings Account)	3,387.61	21,608.19	100.00
Cash (Petty Cash Fund) *(2)*	500.00	500.00	75.00
Accounts Receivable from Broker	1,597.13	182.22	182.22
Securities (*Schedule B*) *(3)*	21,108.21	21,131.89	37,310.69
	$37,073.94	$46,202.54	$41,821.43

NET WORTH	1957	1958	1959
Annals Support Fund Account	$10,000.00	$10,904.83	$11,310.25
Atwood Research Fund Account	6,002.55	6,454.96	6,110.08
General Research Fund Account	6,241.84	6,694.25	6,349.37
Non-Serial Publ. Fund Account	1,507.65	3,507.65	3,391.15
Reserve Fund Account	6,723.05	9,901.15	14,398.08
	$30,475.09	$37,462.84	$41,558.93 (4)
DEFERRED CREDIT			
Dues Collected in Advance	$ 6,598.85	$ 7,539.70	$ 262.50
Nystrom Fellowship Fund Account	0.00	1,200.00	0.00
	$37,073.94	$46,202.54	$41,821.43

(1) Additional unrecorded assets not shown above include, as of December 31, 1959:
Office equipment and supplies valued at $ 1,400.00
Inventories of publications valued at $15,400.00
(2) Termed Central Office Account prior to 6/12/59.
(3) Securities are shown at purchase price. Market value as of December 31, 1959 was $61,826.75.
(4) Net worth at December 31, 1959 market value of securities, and including additional assets tabulated in footnote 1, was valued at $82,874.99.

SCHEDULE B — LIST OF SECURITIES

Stocks (Shares)	*Value* (12/31/59)
50 ACF Industries	$ 2,425.00
50 Alabama Gas	1,468.75
25 Ampex	2,681.25
50 Bethlehem Steel	2,725.00
20 DuPont	5,280.00
125 Fairbanks-Whitney	968.75
40 Federated Department Store	2,820.00
30 General Electric	2,973.75
10 General Foods	1,045.00
252 General Motors	13,734.00
20 Goodrich, B. F.	1,775.00
131 Lehman Corporation	3,635.25
60 Massachusetts Investors Trust	840.00
102 Monsanto Chemical	5,661.00
200 One William Street Fund	2,850.00
60 Pacific Gas and Electric	3,855.00
100 Potomac Electric	2,712.50
35 Public Service Electric and Gas, $1.40 dividend pref. common	971.25
31 Socony Mobil Oil	1,286.50
Total	$59,708.00
Bonds	
1 New York Central R.R., 4½%, 2013	$ 608.75
1 Northern Pacific R.R., 4½%, 2047 (12/30/59)	810.00
1 Pennsylvania R.R., 4½%, 1984	700.00
Total	$ 2,118.75
Total, all securities	$61,826.75

AAG COMMITTEES AND EDITORIAL BOARDS 1959-60

The following is a list of Association committees and editorial boards, together with their memberships during the period April, 1959 to April, 1960. Committees and boards that have submitted annual reports to the Association Secretary are indicated by an asterisk. Copies of these reports may be obtained without charge upon request to the Central Office as long as the limited stock lasts.

Executive Committee:
Paul Siple, Lester Klimm, Jan Brock, Arch Gerlach, George Deasy, Henry Kendall, and G. Etzel Pearcy.

ELECTED COMMITTEES

*Credentials:**
Richard Thoman, Chairman ('60), Clarence Olmstead ('61), and Robert Harper ('62).

Honors:
Gilbert White, Chairman, Harold McCarty, and J. Russell Whitaker.

Nominating:
Clarence Jones, Chairman, John Augelli, and Edward Ullman.

APPOINTED COMMITTEES

AAG Fellowships (Nystrom Award):
Herbert Gross, Chairman ('60), Eugene C. Mather ('61), and George Hoffman ('62).

*Air Force ROTC:**
Shannon McCune. (A "stand-by" Committee.)

Bureau of Census Advisory:
Wilbur Zelinsky, Chairman, John Alexander, Loyal Durand, William Garrison, George Jenks, Harold Mayer, Raymond Murphy, Howard Nelson, and Edward Ullman.

*Cartography:**
Fred Foster, Chairman, James Flannery, Richard E. Harrison, George Jenks, Allen Philbrick, Erwin Raisz, and Robert Voskuil. (Harrison is Editor for *Annals* Map Supplement, and Voskuil is liaison with U.S. National Atlas Committe.)

*Chinese Geographical Literature:**
Herold Wiens, Chairman, Norton Ginsburg, Theodore Herman, James Hsieh, Charles Hu, Frederick Hung, Rhoads Murphey, Joseph Spencer, and ex-officio K. Kitagawa.

Climatology:
David Miller, Chairman, John Borchert, Reid Bryson, F. Kenneth Hare, Glenn Trewartha, and Samuel Van Valkenburg.

*Constitution and By-Laws:**
John Rose, Chairman, George Cressey, J. Sullivan Gibson, and John Taylor.

*Education (Joint with NCGE):**
Clyde Kohn, Chairman, Phillip Bacon, Clarence Olmstead, Preston James, (NCGE members: Gilbert White, Chairman, Norman Carls, Edna Eisen, and Samuel Van Valkenburg).

*Exchange of Publications:**
Nordis Felland, Chairman, John Coulter, and Chauncy Harris.

Finance:
J. Warren Nystrom, Chairman, Wallace Atwood, Jr., and Leonard Dykes.

Field Trip Committee for Dallas Meeting:
Stanley Arbingast, Chairman, J. Edwin Becht, Lorrin Kennamer, and Robert M. Taylor.

Geographers in Business:
John Reith, Chairman, Stanley Arbingast, Albert Ballert, George O. Davis, and Howard L. Green.

*Geographers in Government:**
Lloyd Black, Chairman, William Whipple Abbe, Richard Hall, John Kern, Margaret Kingman, Ruth Lee, Alvin Munn, G. Etzel Pearcy, and Louis Quam.

*Handbook-Directory:**
Herman Friis, Chairman, and A. Phillip Muntz.

*International Fellowships:**
Donald Patton, Chairman, and Walter Deschler.

Local Arrangements – Dallas:
Edwin Foscue, Chairman, John Bergmann,

Virginia Bradley, and Lee Knox.

Local Arrangements – East Lansing:
Lawrence Sommers, Chairman, Dieter Brunnschweiler, Charles Boas, Paul Morrison, Allen Philbrick, Edward Prophet, and Clarence Vinge.

Mass Data Processing:°
Howard Roepke, Chairman, Reid Bryson, Arnold Court, William Garrison, Robert Klove, and William Warntz.

Membership:
Lyle Gibson, Chairman, J. Sullivan Gibson, Robert Klove, John Morris, Herbert L. Rau, and David A. Smith.

Military Geography:
Thomas R. Smith, Chairman, Alfred Booth, Louis Peltier, and Lester Trueblood.

Participation Fellowships for IGU:
Chauncy Harris, Chairman, Wallace Atwood, Jr., and Kirk Stone.

Placement:°
William Whipple Abbe, Chairman, John Abrahamson, Charlotte Burtis, Betty Didcoct, Lois Olson, Harold Sweed, and John L. Taylor.

President's Committee on Advancement of the Association:°
Last six presidents and last two secretaries.

Programs:°
E. Willard Miller, Chairman, Andrew H. Clark, George B. Cressey, Henry Kendall, and Alfred H. Meyer. (A special ad hoc committee.)

Program – Dallas:
Harry Hoy, Chairman, Edwin Foscue, Frank Keller, Fred Kniffen, and Dan Stanislawski.

Program – East Lansing:
Eugene C. Mather, Chairman, Ross Mackay, Allan Rodgers, Arthur Robinson, and Lawrence Sommers.

Publications:°
Henry Kendall, Chairman, Ruth Baugh, Andrew Clark, Phyllis Griess, Howard Hirt, Fred Kniffen, Walter Kollmorgen, and William L. Thomas, Jr.

Regional Divisions:
Vice-president plus Division Chairmen.

Research Grants:
G. Donald Hudson, Chairman, and Charles Hitchcock.

Resolutions – Dallas:
Guy-Harold Smith, Chairman, Leslie Hewes, and Lawrence M. Sommers.

Status and Trends in Geography:°
Clarence Jones, Chairman, Albert Ballert, Wilma Fairchild, Grady Tucker (for Howard Green), Preston James, and G. Etzel Pearcy.

EDITORIAL BOARDS

Annals:
John E. Brush, Jen-Hu Chang, William Garrison, Edwin H. Hammond, Leslie Hewes, Hibberd V. Kline, David H. Miller, James J. Parsons, and Norman J. G. Pounds.

Monograph Series:°
Stephen Jones ('60), Richard J. Russell ('61), and Thomas R. Smith ('62).

REPORT ON THE AAG MONOGRAPH SERIES

The Editor and Board of the Monograph Series have little to report beyond headache and eyestrain. In all, some ten items have been suggested for consideration since the last report; seven were sent to the Editor in more or less complete form; four were circulated to the Board; and one of these is still under consideration as this report is written. The others have been returned with regrets to the authors, and with lengthy and detailed criticisms attached for which the authors have expressed appreciation.

The Board is pleased with the enthusiastic acceptance of its first monograph and regrets that it has not yet been able to agree on approval for a second one. But it also observes with pleasure an increased interest in the series by members of the Association and others, and what it believes to be a general improvement in quality of manuscripts submitted. It hopes that the careful and detailed criticism offered on submitted manuscripts that have been returned will encourage the greatly desired further increase in both quantity and quality. The Board reemphasizes that it has no bias toward any particular kind of work,

although it clearly feels that new and significant information, promising innovations in research methodology, and well supported theoretical generalizations are among the qualities which are desired.

Each year one member of the Board changes, and the Editor himself hopes soon to be replaced, but all members feel that the Monograph Series should be maintained and encouraged until the long and distinguished series first envisioned becomes a reality. The support of members of the Association through submission of good manuscripts, in order that we may choose from the best geographical work, is solicited. Thus can we find and publish the best, and establish ever higher standards of scholarship and research in the profession.

Andrew H. Clark, Editor
AAG Monograph Series

SPECIAL ISSUE OF THE *ANNALS* FOR STOCKHOLM CANCELLED

Because of the necessity for editing and sending to press at an early date any special issue of the *Annals* for shipment to Stockholm, it was necessary to set a deadline of February 1 for papers to reach the Editor. There were not received by that date sufficient papers in condition for publication to be representative of geographical work in the United States. Consequently, the special issue would be too small and too unrepresentative to warrant publication.

The Association wishes to thank those who met the deadline and submitted papers to the Editor of the *Annals*, but regrets to announce cancellation of plans to release a special issue which would contain most of the papers to be presented by U.S. geographers at the International Geographical Congress. The Editor of the *Annals* will be pleased to receive completed papers, particularly in longer form than they will be delivered at Stockholm, for consideration in connection with the regular issues of the *Annals*.

Arch C. Gerlach, Secretary

REGIONAL DIVISIONS

Middle Atlantic Division

The Middle Atlantic Division of the AAG held its annual meeting at the National Academy of Science on January 16, culminating an active program year. The fifteen papers read were well-balanced between systematic and regional geography. The majority of those presenting papers were from universities in the region, but several government geographers read papers dealing with their leading academic interests in the field of geography. As a special guest, Mr. Nathaniel Abelson, Map Librarian of the United Nations, also read a paper.

A well attended luncheon intervened between the morning and afternoon sessions. At that time members of the Division were privileged to hear a talk by Dr. Paul Siple, President of the AAG, in which he discussed regional responsibilities of the Divisions. He also presented his views concerning the future destiny of the Association.

New divisional officers for 1960 include Dr. John P. Augelli, Chairman; Dr. Jerome P. Pickard, Program Chairman; Captain Dorotha J. Garrison, Special Events Chairman; and Miss Ann G. Love, Secretary-Treasurer. The retiring officers were Dr. G. Etzel Pearcy, Chairman, and Dr. Malcolm E. Robinson, Program Chairman. Dr. Richard E. Murphy, the elected Special Events Chairman, now at the University of Wyoming, was replaced during the last half of 1959 by Dr. Joan Barry. Mr. George Waggoner served as co-chairman for the annual meeting. Miss Love was also Secretary-Treasurer for the 1959 year.

The Middle Atlantic Division held six evening programs and nine luncheons in 1959. For the first program in the spring, Mr. Albert H. Farnsworth of the Curtis Publishing Company in Philadelphia discussed some of the tasks associated with publication of *Holiday* magazine, stressing the geographical phases. The next two programs featured Dr. John Taylor, from the

Committee on Interior and Insular Affairs, House of Representatives, who gave a background view of Hawaii and its statehood problems at the height of the issue in Congress, and Dr. Chia-Min Hsieh, of Catholic University, who presented an illustrated talk about Taiwan.

At the first autumn meeting, Dr. Lester E. Klimm, of the University of Pennsylvania, probed the depths of geographical philosophy with his remarks on the concepts of time versus those of space. The two final evening programs, both illustrated with kodachromes, dealt with the East: Dr. Richard Ruggles, University of British Columbia, told of his experiences in the Soviet Union while on a trip from Leningrad to the Iranian border; and Mr. William Davies, U.S. Geological Survey, gave a preview of the setting of the 1960 International Geographical Congress by means of pictures and comments on the Scandinavian countries.

Due to the heavy concentration of geographers in the Washington area, monthly luncheons sponsored by the Middle Atlantic Division were very successful. Geographers from government, universities, and private business firms were able to relax for an hour while renewing acquaintances and exchanging ideas. Attendance typically ranged from 40 to 60, though the latter figure was by no means the record. The new officers are already at work planning interesting programs and bigger and better luncheons for 1960.

NOTE FROM THE EDITOR

It is with great pleasure that the Editor announces appointment of George F. Deasy as Associate Editor of *The Professional Geographer* by the AAG Council. Both Editors have worked together extensively in research and publication during the past decade. Professor Deasy has participated actively in preparation of *The Professional Geographer* since it acquired a new format, and many of its features are a product of his ideas. It is the hope of both Editors that they may serve members of the Association by providing through *The Professional Geographer* an outlet for shorter research studies and a channel of communication for the profession.

Phyllis R. Griess, Editor

COPIES OF *PROGRAM* AVAILABLE

A limited supply of the 120 page *Program* of the 56th Annual Meeting of the Association of American Geographers, held in Dallas on April 17-21, 1960, is available at the Central Office of the Association. The price is $1.00 per copy.

The *Program* contains abstracts of all papers presented and read by title at the meeting. For those not attending the meeting, the *Program* furnishes a means of keeping up to date with current research in geography.

ANNOUNCEMENTS AND REPORTS

GEOGRAPHY SESSIONS AT AAAS MEETING IN CHICAGO

The 1959 meeting of the American Association for the Advancement of Science, held December 26 - 31 in Chicago, included several sessions sponsored by the Association of American Geographers and one session sponsored by the Illinois Geographical Society. Some 60 geographers attended one or more sessions.

The AAG co-sponsored Great Lakes Basin symposium included papers by geographers (William Powers, Andrew H. Clark, and Albert G. Ballert), geologists, and engineers, and commanded the largest attendance of any Section E meeting. It is hoped that the papers from these sessions will be published as one of the AAAS symposia volumes.

The symposium on The Geographer's Role in Transportation Studies, sponsored by the AAG, was opened by Edward J. Taaffe of Northwestern University, who indicated that the session was essentially a discussion of applied geography with the Chicago Area Transportation Study as a case study. The first three participants, E. Wilson Campbell, John R. Hamburg, and Robert Sharkey, presented in order the history, scope, and purpose of a transportation study, and gave methods of obtaining and compiling factual information on land use, flow inventory, and travel within the study area. The concluding paper, by Garred Jones, outlined methods of using this information by means of punch cards and magnetic tape in the preparation of maps, models, and other aids to be used in planning Chicago's highway system.

The session devoted to papers on Southwest Asia and Africa, sponsored by the AAG and chaired by Alden Cutshall, contained four papers. H. E. Wright, Jr., of Minnesota, in discussing late Pleistocene glaciation in Southwest Asia, indicated that cirques are found as low as 5,000 feet and morainal deposits in valleys as low as 2,500 feet. Charles Reed, an environmental zoologist from the University of Illinois Professional Colleges, traced the continuity of animal life during the late Quaternary in northern Iraq as recorded in the archeological sites of the area. Both speakers indicated that incipient cultivation and animal domestication, which began in this area some 10,000 years ago, cannot be correlated with any discernable climatic change at the end of the Pleistocene. Karl Butzer of the University of Wisconsin, using illustrations drawn from his studies in Egypt, further emphasized that there is no scientific basis to the theory of progressive desiccation, i.e., no evidence of negative environmental anomalies invoking positive human reactions. Neither in Egypt nor in Mesopotamia, then, can Toynbee's physical challenge theory be applied. Marvin Mikesell, University of Chicago, presented a stimulating inductive approach to plant ecology with examples from northern Morocco. After studying clumps of forest preserved on sacred sites, along with other evidence, he concluded that the potential vegetation of northern Morocco should be a wooded ecotone. The present lack of forests was attributed to chopping, burning, browsing, or some combination of these factors since man and animals have inhabited the area.

A single session on Economic Change in Underdeveloped Areas was sponsored by the Illinois Geographical Society. Arranged by Mary Grant, IGS President, and with Dalias Price as Moderator, this symposium consisted of five papers, as follows: (1) "Some Recent Changes in the Economy of Egypt," Floyd F. Cunningham; (2) "Post-War Changes in Nigeria," Robert O. Johnsrud; (3) "Some New Developments in Thailand's Economy," Helen H. Smith; (4) "Patterns and Progress in the Philippines," Alden Cutshall; and (5) "Economic Changes in the Region of Brazil's New Capitol, 1945-1959," Robert L. Carmin. It is hoped that a summary of each of these five papers will appear in the spring issue of the IGS *Bulletin*.

Alden Cutshall
University of Illinois

NEWS FROM GEOGRAPHIC CENTERS

CEYLON, UNIVERSITY OF

The Department of Geography now has an enrollment of more than 500 students. There also are a few students enrolled for the master's degree.

Current offerings include cartography; techniques of field work; physical, regional, economic, historical, and applied geography; and problems of modern geography.

Dr. K. Kularatnam is the Professor and Head of the Department, which also includes Dr. G. Thambyahpillai, Lecturer, and several Probationary Assistant Lecturers and Laboratory Assistants. Further additions to the staff are planned.

Mr. Dias and Mr. Panditaratne, both Probationary Assistant Lecturers, are now on leave studying in England.

The department expects to move into the new Geography-Geology Building in 1960.

CONNECTICUT, UNIVERSITY OF

During the spring semester of 1960 an Earth Science Program for In-Service Teachers is being inaugurated, in which climatology and geology are the courses to be offered. The program is being supported by the National Science Foundation. It will be offered again during the coming summer, and also during at least one semester of the next academic year.

This spring George R. Rumney will offer climatology on Saturday mornings to a group of 25 science teachers selected from a total of over 50 who applied to take the course. Climatology is regularly presented in the fall semester to upperclassmen without prerequisites, as part of the established geography curriculum. Emphasis is placed on laboratory and field trip activities, including all-day excursions to Mount Monadnock, New Hampshire; the U.S. Weather Bureau's First Order Station at Bradley Field; and the University's Marine Research Laboratory at Noank, Connecticut. Advantage is taken, for instructional purposes, of the two climatological research centers Dr. Rumney has been establishing at the Marine Research Laboratory, and the Experiment Station near the campus at Storrs.

INDIANA UNIVERSITY

Last October the Department moved into spacious quarters above and below the deans in Kirkwood Hall. Here every faculty member (except Stephen Visher, who elected to stay with his extensive library in the old Social Science building) has his or her own room. Other much appreciated features are an air-conditioned cartography laboratory and dark room; a duplicating room; a large, well-lit map library and reading room; private studies for graduate students; and two rooms equipped especially for the freshman laboratory course in physical geography. These facilities are enjoyed by an enlarged faculty and a growing student body.

The Department marked the occasion of its re-housing by issuing a 16-page brochure on its program and facilities. This brochure, entitled *Geography at Indiana University*, is available free on request. The Department also put on a house-warming party by way of expressing its gratitude to all who had come to its aid.

At the beginning of the 1959-60 academic year, the Department was strengthened by the addition of Don C. Bennett from Syracuse University and Robert N. Taaffe who had spent the previous 12 months in the USSR. Norman Pounds returned to the campus from the University of Kansas, via Eastern Europe, to become University Professor, a title enjoyed by no other member of the Indiana University faculty. Visiting professor B. J. Garnier stayed for a second semester to continue his reorganization of the freshman physical geography course.

This semester George Kuriyan, University of Madras, is in residence as a visiting professor; and J. Fraser Hart is lecturing in France at the University of Lille.

The faculty continues to be productive, each member having had articles or books, or both, published in the last year or so. Hutchinson published Norman Pound's latest book, *The Geography of Iron and Steel*. The National Academy of Science – The National Research Council published Kempton Webb's *Geography of Food Supply in Central Minas Gerais*, and the Banco do Nordeste do Brasil, S.A. sponsored the

publication of his *Suprimento de Generos Alimenticios Basicos para a Cidade de Fortaleza.* Doubleday published three booklets in its *Around the World* series by Robert C. Kingsbury and his wife, Patricia. The publication of George Kimble's two-volume study of tropical Africa is scheduled for early fall.

Most members of the faculty were in the field last summer. Otis Starkey, accompanied by Robert Kingsbury and Arlin Fentem (now at Western Illinois), was in the British Lesser Antilles working on an ONR contract. J. Fraser Hart continued his settlement studies in various parts of eastern United States. Kempton Webb worked in Mexico on markets. A. J. P. McCarthy pursued his researches in the historical geography of the Oswego region. Joan Wilson Miller, accompanied by her husband George Miller, made a second reconnaissance of the northwest Arkansas region; and Norman Pounds continued his work on the industrial geography of Eastern Europe.

Thomas Barton has continued as editor, and George Miller as assistant editor, of the *Journal of Geography,* which acquired a "new look" in the January, 1960 issue. Seven members of the faculty (Messrs. Barton, Bennett, Garnier, Kimble, Kingsbury, Starkey, and Webb) continued to serve on the Humid Tropics Commission of the IGU, and made contributions to its forthcoming *Selected Annotated Bibliography.*

NEW YORK UNIVERSITY

During the last few years geography instruction at NYU has been reorganized. Most courses are now offered in the General Course Division (Professor Henry C. Atyeo, Chairman) of the School of Commerce, Accounts, and Finance in Washington Square. Here, introductory (physical and economic), regional (North and South America, Europe, USSR, Africa, and Asia), and advanced systematic (urban, industrial, and transportation) courses are taught. All courses are taught both in the day and evening. Except for specialists, all geography courses are electives; they rate as professional courses for students of management, international trade, real estate, transportation, and public utilities. Students from the other schools of NYU come to the School of Commerce for geography instruction. The presence of these students has permitted widening the cultural content of the advanced regional courses. A field trip course in the Summer Session stresses the unique industrial location aspects of the New York Metropolitan area.

Dr. Alexander Melamid, Associate Professor, is in charge of geography instruction. He continues his research into the geography of the petroleum industry and expects to go to Nigeria during the summer of 1960 for a study of recent oil development in the delta of the Niger. Mr. Leo Toch, Instructor, continues his work on the geography of American railroad transportation. He is a reserve officer in the Army Transportation Corps and instructs personnel in a Railway Operating Battalion. Mr. Braverman, Graduate Assistant, is studying the geography of the diamond industry in British Guiana. Interdisciplinary discussions and reports on research projects regularly take place at faculty symposia to which students are invited.

RUTGERS — THE STATE UNIVERSITY

The Department of Geography, Rutgers — The State University, is operating currently two in-service institutes in earth sciences, one for secondary school teachers and the other for elementary school teachers. The Directors of these institutes are Professors William Goodwin and Guido Weigand, respectively. For the summer session, 1960, the National Science Foundation has provided another grant for a six-week earth science institute for elementary school teachers. The Director will be Guido Weigand, and Dr. Erwin Biel of the Rutgers College of Agriculture will give instruction in meteorology and climatology.

The basic purpose of these institutes is to increase subject matter knowledge of teachers in elementary and secondary schools. The program is divided into two major sections, the first one dealing with fundamental earth-sun relationships and principles of geomorphology and the second concentrating upon elements of weather and climate.

Professor John E. Brush has been invited to participate in a seminar on Indian cities at the University of California (Berkeley) in June, 1960. He will present a paper entitled, "Morphology of Indian Cities." Also, he has received a travel grant from

the American Council of Learned Societies to participate in the International Geographical Congress at Stockholm this August. He will present a paper entitled "Changing Land Uses and Land Values during Three Centuries in New Jersey."

OTHER ITEMS

DIRECTORY OF COLLEGE GEOGRAPHY

The *Directory of College Geography of the United States*, Volume XI, will be published April 1, 1960, and will contain professional and academic data for 1959-60. There will be essentially no change in format and arrangement of information from the more recent editions. It will carry the data on curriculum, enrollment, staff, and publications. All reporting Departments will receive one free copy. Additional copies may be obtained from the Department of Geography, University of Kentucky, Lexington, at one dollar per copy for nonmembers and fifty cents per copy for members of the AAG and students.

LISTING OF GEOGRAPHERS IN AMERICAN MEN OF SCIENCE

The Tenth Edition of *American Men of Science* will be published with the Physical and Biological Sciences combined alphabetically in a four-volume series, and with a separate alphabetical volume for the Social and Behavioral Sciences. This brings up the important problem as to where those associated with geography belong in accordance with the division. The Editor has decided to give geographers a choice of the volume in which they wish to be included. When they are in cross-over fields, reference can be made from one volume to the other. Full biographies can only appear in one volume.

Those geographers who have a preference for either a reference or a full biography in the Physical and Biological Sciences should express their wishes immediately to Jaques Cattell, Editor, *American Men of Science*, Annex 15, Arizona State University, Tempe, Arizona. Unless such a wish is expressed in writing, geographers will appear in the Social and Behavioral Sciences volume. Forms for the A-E volume of the Physical and Biological Sciences are closed. All information for later volumes should be in the hands of the Editor immediately. Requests for biographical information from those who are to be included in the Social and Behavioral Sciences volume will not be mailed out for some time.

EARTH SCIENCES REGISTER

During the spring of 1958 questionnaires were sent to AAG members by the American Geological Institute which undertook to compile a register of personnel in the Earth Sciences. Returns totaled 958, or 48 per cent of the AAG membership. Tabulation of data from the questionnaires, supplied by Arch C. Gerlach, Secretary of the Association, reveals some facts of general interest, as follows.

Most geographers are relatively young people, 42 per cent being between 30 and 39, and 80.8 per cent between 25 and 50 years old. Only 4.7 per cent are over 60. On the other hand, the beginning age in the profession is well past that of the average college graduate, for only 1.5 per cent are less than 25 years old.

The principal employment functions of geographers are teaching (56.4%), research (18.9%), and management (13.2%). About 60 per cent of geographers are employed in colleges or universities, including some administrative and research as well as many teaching positions. The Federal Government employs 18.3 per cent, and other government agencies 3.6 per cent of geographers. More than 8 per cent are in industry.

Salaries increase with age, from an average of $2,000 per year for the age group under 25 to $9,000 for the 55-59 age group, and then diminish to $8,167 for the group over 65. The average salary for all geographers reporting is $6,544. In general there is a close correlation between salaries and degrees. For example, in the age bracket of 30-34, which includes 205 questionnaire returns, average salaries are $3,000

without a college degree, $5,222 with a B.A., $5,463 with an M.A., and $6,214 with a Ph.D. The average for all levels of education in that age group is $5,628.

A new questionnaire is being prepared for distribution to all members of the AAG. With it you will receive a more detailed tabulation of statistical data than is provided in the summary above. It will be of real help to the Association if each member will cooperate by filling out and returning the new questionnaire promptly.

1959 FOREIGN FIELD RESEARCH PROGRAM AWARDS

On December 14, 1959 a Screening Committee consisting of Drs. Edward A. Ackerman, Lester E. Klimm, Shannon McCune, and Edward B. Espenshade, Jr., ex officio, met at the National Academy of Sciences to consider applications for the fifth competition under the Foreign Field Research Program. Thirty-three applications were reviewed, representing 21 schools and 11 regions of interest. The Committee recommended support for proposals by the following eight applicants, and all recipients of awards have accepted.

Chamberlain, Theodore K., Scripps Institution of Oceanography, *Physical Geography of Suruga, Sagami, and Toyama Submarine Canyons, Japan* (24 months in field).

English, Paul W., University of Wisconsin, *Minority Cultures and their Impact upon the Landscape, Iran and India* (18 months in field).

Finch, William A., Jr., University of Illinois, *Physical Conditions Associated with Karst Occurrences in Northern Yucatan Peninsula, Mexico* (8 months in field).

Hough, Richard F., University of Wisconsin, *Areal Analysis of Changes in Japanese Sericulture, 1930-1960* (14 months in field).

King, James W., University of Utah, *The Nile Transportation System in Uganda* (12 months in field).

Roder, Wolf, University of Chicago, *Social and Economic Impact of a Water Resources Development Project, Southern Rhodesia* (13½ months in field).

Schul, Norman W., Syracuse University, *Sequent Settlement Geography of a Central Philippine Sugar Cane Plantation* (12 months in field).

Vermeer, Donald E., University of California, *Influence of Environmental Factors on the Diet of Native Tropical Peoples, Nigeria* (14 months in field).

This brings to 45 the number of projects supported under the program. Six reports have been published, two will be published shortly, and one is being edited for publication. Fifteen investigators have returned from the field and are working on their reports, 13 are still in the field, and 8 will go into the field within the next year.

This program, which is supported by the Geography Branch of the Office of Naval Research and administered by the Earth Sciences Division of the National Academy of Sciences, provides opportunities for young scientists to undertake studies abroad on subjects of their own choosing.

EARTH SCIENCE TEACHING AID

A new aid to the teaching of earth sciences at levels from the upper elementary grades through junior college has been developed by the National Academy of Sciences, with grants from the Ford Foundation and the National Science Foundation.

Known as "Planet Earth," it consists of six color posters, 34 by 48 inches, keyed to a 44-page student brochure, and accompanied by a teacher's kit which includes a classroom experiment booklet. The subject matter, treated in narration and in modern art work, covers the nature and structure of the earth; oceans, glaciers, weather and climate; the upper atmosphere; and rocket and satellite exploration of space. The material has drawn favorable comment from scientists and educators, not only as a teaching aid but also as a means of interesting young people in science as a career.

A descriptive circular on "Planet Earth" is available on request from the Printing and Publications Office, National Academy of Sciences, Washington 25, D.C.

IBERIAN TOUR

Ena L. Yonge, Map Curator of the American Geographical Society, will be leader of a tour into Portugal and Spain scheduled from September 2 to October 20, 1960. Members of the tour may attend the International Congress of the History of the

Discoveries, Lisbon, September 4 to 12, an event marking the 500th anniversary of the death of Prince Henry the Navigator (1395-1460). The Congress program will include papers on early cartography, discussions, social gatherings, and excursions. The tour party will then proceed by bus north to Coimbra and Oporto; and then eastward into Spain, via Salamanca and Burgos, to Madrid and nearby Segovia, Avila, and Toledo. The tour will continue south to Gibraltar, via Merida, Seville, and Cadiz; then up the east coast to Barcelona, with a side trip into Andorra. The cost is $1335 per person; adjustments can be arranged for those not wishing to attend the Congress in Lisbon, and for those preferring ocean transport.

CLASSIFICATION SCHEMES SOUGHT

The Committee on Special Classifications of the Special Libraries Association and the Classification Committee of the Cataloging and Classification Section, Resources and Technical Services Division, American Library Association, are cooperating in a continuing project to develop and expand a Loan Collection of library classification schemes originally established by the Special Libraries Association. This Collection covers all fields of science, law, medicine, technology, the social sciences and the humanities.

New libraries or libraries with special collections are constantly asking for classifications, in all areas of knowledge, and it is imperative that the Collection be kept up-to-date through the addition of new schemes or with modernized versions of existing classification schedules. Curators of special collections, special librarians, and those individuals who have developed special classification schemes for specific types of material or for special subjects are invited to contribute a copy of their work to the Collection. Classification schemes should be sent to Dr. Jesse H. Shera, Curator, SLA Loan Collection, School of Library Science, Western Reserve University, Cleveland 6, Ohio.

NEW GLACIOLOGICAL PUBLICATION

The first number of a new quarterly bulletin, *Glaciological Notes*, was issued in January, 1960, by IGY World Data Center A: Glaciology. The bulletin contains information dealing with glaciers and processes of glaciation. Its purpose is to increase exchange of glaciological information in the United States and with foreign glaciologists. *Glaciological Notes* also will provide information about the operation and collections of the Data Center, meetings, available positions, research opportunities, translations of foreign glaciological publications, quarterly accessions of the Data Center's library, current and planned field and research activities, and occasional special reports. Active participation of its readers in contributing suggestions and appropriate information items is encouraged.

The four 1960 numbers are being distributed free. A limited supply is still available of No. 1 and of an accompanying supplement describing some of the 1959 glaciological activities. Address requests for these and subsequent issues to IGY World Data Center A: Glaciology, American Geographical Society, Broadway at 156th Street, New York 32, N.Y.

TENTH PACIFIC SCIENCE CONGRESS

The Ninth Pacific Science Congress at Bangkok accepted the joint invitation of the National Academy of Sciences and the Bernice P. Bishop Museum to hold the Tenth Congress in Honolulu. This will be held in cooperation with the University of Hawaii from August 21 to September 6, 1961. The Congress circular of information describing the program, field trips, and other matters, will be issued in August, 1960.

The problem of travel funds for attendance at the Congress is a matter to be worked out by each individual scientist. Neither the Pacific Science Board of the National Academy of Sciences nor the Executive Committee of the Congress will have funds for this purpose, except for special guests. It is expected that some travel assistance to the Congress will be available from a number of foundations and other organizations that customarily support travel to international meetings, and individuals requiring financial assistance might make inquiries at such sources at the appropriate time.

A copy of the preliminary announcement concerning the Congress may be obtained

from Harold J. Coolidge, Executive Director, Pacific Science Board, National Academy of Sciences, Washington 25, D.C.

ASIA FOUNDATION GRANT

The American Geographical Society announces that it has received a $2500 grant from the Asia Foundation to aid Asian libraries and Asian scholars temporarily in the United States.

The grant will be used to provide selected libraries with the society's journal, *The Geographical Review*. In addition, small stipends, ranging up to $300, will be offered to students and scholars currently in the United States, to enable them to do research at the society. The allowances are to help pay transportation costs to the society and to help with living expenses while doing research.

Applicants must be at least at the graduate level and may come from any Asian country from Afghanistan eastward, except for Australia, New Zealand, and territories of the South Pacific.

An applicant should write stating his academic position, the nature of his stay in the United States, and the sum necessary for transportation to the society and for living expenses. He may write to Dr. Charles B. Hitchcock, Director of the American Geographical Society, 156th Street and Broadway, New York City or Dr. George B. Cressey, Syracuse University, Syracuse, N.Y., chairman of the grants committee.

MEDAL TO SIPLE

The Danish Royal Geographic Society at its meeting in Copenhagen on February 2, 1960, presented the Hans Egede Medal for polar geographic research to Dr. Paul A. Siple, recently President of the Association of American Geographers and noted for his Antarctic explorations. Vice Admiral Vedel made the presentation. Dr. Siple gave a lecture to the Society on the U.S. Army Research Activity on the Greenland Icecap. Response was given by Professor Niels Nielsen, head of the Geography Department at the University of Copenhagen.

GRANT TO BISHOP MUSEUM

A grant of $8,500 from the National Science Foundation has made possible the establishment at Bishop Museum, Honolulu, Hawaii, of a clearinghouse for geographical and natural history information about the Pacific called Pacific Scientific Information Center.

The following related activities have been initiated: compilation of a card catalog of scientists doing research on, or actively interested in, Pacific geography, its land flora and fauna, and man in relation to his Pacific Island environment; a bibliography of publications having to do with these subjects; and the expansion of data files and collections of maps and air photographs of Pacific islands, which include Polynesia, Micronesia, Melanesia, New Guinea, and related areas.

The object of these activities is to learn "who knows what" about Pacific islands, their people, plants, and animals, and what are the more important publications concerning these topics. To make results available to others, ways and means are being studied for rapid and inexpensive reproduction of graphic materials.

Persons interested in these projects are invited to contact E. H. Bryan, Jr., Bishop Museum, Honolulu 17, Hawaii.

SOVIET UNION AND COMMUNIST EAST EUROPE TOUR

The University of Wisconsin Extension Division is sponsoring a Study-Travel Tour to the Soviet Union and Communist East Europe during the summer of 1960, the Study Program to begin March 7, and the Travel Program to begin June 23 and end August 5. Modification of pre-study tour requirements can be made for AAG members who may wish to combine the tour with attendance at the IGU meeting in Stockholm. For further information write Dr. Robert H. Schacht, 303 Extension Bldg., The University of Wisconsin, Madison, Wis.

NEW GEOGRAPHICAL JOURNAL

The first biannual geographical journal of Indonesia is being published by the Department of Geography, Faculty of Letters and Culture, of the Gadjah Mada University.

Named *The Indonesian Journal of Geography*, it specializes in the study of significant geographical problems of Indonesia

and Southeast Asia. It will serve as an outlet for the research work of Indonesian geographers and others who are interested in the problems of this area. Those who wish to receive a sample copy should write to Dr. M. Halim Khan, Head of the Department of Geography, Faculty of Letters and Culture, Gadjah Mada University, Jogjakarta, Indonesia.

AAAS MEETING, DECEMBER 1960

Section E (Geology and Geography) of the American Association for the Advancement of Science will hold its sessions between December 27 and 30 this year at New York City in the Grand Central Station vicinity. The Section E meetings will have several symposia, including an interdisciplinary session on Urban Renewal. Details about this program will appear in forthcoming issues of *The Professional Geographer* and in the May 27 issue of *Science*.

Geographers who wish to present research results at the meetings are requested to announce their intentions as soon as possible. However, 250-word abstracts, to be published in the *Bulletin of the Geological Society of America* may be submitted at any time before September 15. Ideas for integrating projected papers into symposia will also be most welcome. Address correspondence to the AAG coordinator for geography papers in Section E, Charles C. Morrison, Jr., American Geographical Society, Broadway at 156 St., New York 32, N.Y.

NEW GEOGRAPHY DEPARTMENT

A Department of Human Geography has recently been established at the Delhi School of Economics by the University of Delhi, India. The new department will offer only a graduate program leading towards the master's and doctor's degrees in human geography, especially in agricultural or other aspects of economic geography and in the geography of population and settlements. The first group of students will enter in July, 1960 for a two-year master's program.

Shyam S. Bhatia, who has a doctorate from the University of Kansas, has been appointed Reader and Head of the department. Also on the staff is Mrs. Savitri G. Burman, who has a doctorate from Clark University and was for some years with the University of Rangoon in Burma.

Vernor C. Finch, President of the A.A.G., 1938; Treasurer, 1924-28; Vice President, 1934; died October 23, 1959 at Madison, Wisconsin. Dr. Finch taught at the University of Wisconsin from 1911 until his retirement in 1953. He was co-author (with O. E. Baker) of Geography of World Agriculture, **a federal publication; co-author (with R. H. Whitbeck) of** Economic Geography; **and co-author of** Elements of Geography **(with G. T. Trewartha). He also was the author of a series of wall maps and several articles. He was 76 at his death.**

John Hopkins died January 14, 1960, the day before his 38th birthday. He was born and reared in Cincinnati, Ohio. During World War II, he served as a weather observer with the Army Air Force. He began teaching at the University of Georgia in 1955, was on the staff of Southern Illinois University from 1955 to 1959, and moved to the State College at Winona, Minnesota in September, 1959. Mr. Hopkins' special interests were the geography of plant diseases and Africa. He is survived by his wife, Marian, a member of the staff of Southern Illinois University.

NEW PUBLICATIONS

Africa: Its Peoples and Their Cultural History. GEORGE P. MURDOCK. McGraw-Hill Book Co., Inc. New York. 1959. xiii and 456 pp. illust. $8.75.

This book surveys the indigenous cultures of Africa, including major migrations of peoples and the cultural developments that have taken place since about 5,000 B.C. Special emphasis is placed upon forms of social and political organization, exchange of food plants between Africa and other parts of the world, and contributions by Africans to the rest of the world.

The book is divided into 11 parts. The first, entitled Orientation, deals with such items as geography, race, language, society, government, and history. Subsequent parts treat African hunters, the Sudanic agricultural civilization, North African cultural civilization, synthesis in the Nile Corridor, southward expansion of the Cushites, cultural impact of Indonesia, expansion of the Bantu, East African pastoralism, spread of pastoralism to the Bantu, and North and West African pastoralism. Seventeen maps illustrate various facets of the book such as environmental conditions; distribution of races, tribes, languages, indigenous economies; and selected communication routes and crops.

The publication is a scholarly work of high caliber, and represents a great amount of research. It will be valuable to any geographer who has an interest in Africa.

P.R.G.

Ancient Population of Siberia and Its Cultures. A. P. OKLADNIKOV. Russian Translation Series, Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. I, No. 1. Peabody Museum. Cambridge, Mass. 1959. vii and 96 pp. illust. $3.50.

Despite the recent upsurge in Russian language studies, relatively few American scholars have access to the literature covering some of the largest areas of the earth. For those interested in the growth and development of culture in the U.S.S.R., and for those Americanists concerned with the possible timing and types of influences on North American cultural history, Siberia is a critical area. A valuable insight into the interplay of culture and environment in this region is provided by the translation of a summary article by A. P. Okladnikov, the leading Russian student of Siberian prehistory.

The survey is arranged chronologically: Original Settlement, Neolithic, Bronze, Ancient Tribal Groups, First Millennium B.C., and First Millennium A.D. Especially for the later times, the area is reviewed as follows: Southern Siberia, Eastern Siberia, Transbaikal, and the Maritime region. There are excellent illustrations and useful maps.

Several things stand out. Siberia at least as far east as Lake Baikal has continuously been influenced by happenings in Europe from as early as Upper Paleolithic times. Okladnikov is specific in stating that this included the coming of Europoid peoples. The cultures of the maritime provinces of Siberia on the other hand have equally persistently and from even earlier times been rooted in Southeast Asia. The continuity of culture is so great in the area that from the very beginning, and continuing through to his discussion of historic times, Okladnikov can point out persistences in house types, clothing types, art forms, and ways of living. Upper Paleolithic type houses are still in use, and the natives until recent years went naked when indoors just as the Upper Paleolithic people did 20,000 years ago.

None of the sweeping changes from tundra dwelling hunters of mammoths, to forest dwelling hunters of deer, to pastoral nomads, to settled agriculturists have totally erased the preceding cultural pattern, except for such irretrievably lost items as mammoths to hunt.

Almost as startling as the persistence in

ways of living that are presented in this study are the changes in chronology that are revealed in a slightly later paper by the same author. In an article published in Spanish in Bolivia, "Ancient Cultures of Siberia and the Problem of the First Relations of the Old World with the New World," *Revista de Cultura*, Universidad Mayor de San Simon, Vol. III, Cochabamba, Bolivia, December 1958, Okladnikov has thrust the beginning of settlement in Siberia back into the last interglacial, rather than late in the last glacial period. Curiously, this truly great change in chronology does not affect the pattern already visible. The earliest influences in Inner Asia seem to come from the European side of the continent, whereas those of the coastal areas seem clearly related to influences coming from the south. It is apparent that we are faced here with a very persistent pattern in the occupance of this part of the earth.

GEORGE F. CARTER
The Johns Hopkins University

Dictionary of Discoveries. I. A. LANGNAS. Philosophical Library, Inc. New York. 1959. v and 201 pp. $5.00.

This book presents biographical data for a large number of men who participated in world-wide exploration, both continental and maritime. The names of explorers credited with minor, as well as major, discoveries are included. There also are data for the great instrument makers and others who helped to make the journeys of discovery possible. All entries are arranged in alphabetical order by names. The book provides a unique and very useful reference for those seeking this type of information.

P.R.G.

The Evolution of North America. PHILIP B. KING. Princeton University Press. Princeton, New Jersey. 1959. xvii and 189 pp. illust. $7.50.

The physiography of all or major portions of North America has been analyzed in earlier books by Atwood, Fenneman, Loomis, and others. Some of the previous studies are more scholarly in treatment and more comprehensive in coverage than the present volume; but none excells it in clarity of expression, and obviously none is so current in fact and theory. The author, one of America's leading structural geologists, has been associated with the U.S. Geological Survey for many years and is eminently equipped to deal with his subject. This work is based on lectures presented by the author while serving as visiting professor of geology at the University of California, Los Angeles, in 1955 and 1956.

The book is admittedly limited in areal coverage; it deals mainly with the middle part of the continent—the United States and southern Canada. Moreover, even within this restricted area, coverage of various regions is unequal in emphasis. Nevertheless, the treatment is sufficiently broad in geographical scope to afford a representative overview of the continent's physiography. The major regions allotted chapter or multichapter status include the Canadian Shield, the Interior Lowlands, the Appalachian Mountains and areas of related structure, the Gulf Costal Plain and West Indies, and the mountain and plateau systems of western North America. The latter area in particular is given comprehensive treatment.

The volume is well illustrated with 95 geologic maps and cross-sections and a large folded tectonic map of North America. An abundance of references, together with detailed topical and author indexes, increase the usefulness of its materials. The book is not suitable as an undergraduate textbook for college courses in the physiography or physical geography of North America. It should serve well, however, as a source of enrichment for advanced students and mature scholars whose interests include the regional geology of the continent.

G.F.D.

The Floors of the Oceans: I. The North Atlantic. BRUCE C. HEEZEN, MARIE THARP, AND MAURICE EWING. Special Paper 65. The Geological Society of America. New York. April 1959. 122 pp. illust. $4.50. Accompanying *Physiographic Diagram: Atlantic Ocean (Sheet 1)*, $1.50.

This superb study does for the floor of the North Atlantic portion of the globe what the maps and writings of Erwin Raisz and the late A. K. Lobeck had earlier done

for the North American continent, namely, presents a physiographic diagram of the terrain and divides this terrain into physiographic regions and provinces.

The book and its accompanying 31 by 59 inch map (scale approximately 1:5 million) are the product of some 50 post-World War II expeditions conducted initially by the Woods Hole Oceanographic Institution and later by the Lamont Geological Observatory (Columbia University) with the financial support of the U.S. Navy Bureau of Ships, Office of Naval Research, Geological Society of America, National Geographic Society, Woods Hole Oceanographic Institution, and Columbia University. Additional topographic data employed in the book were obtained from such sources as the (British) National Institute of Oceanography, British Admiralty Hydrographic Department, and the Coast and Geodetic Survey.

The North Atlantic area is divided into three major physiographic regions: Continental Margin, Ocean Basin Floor, and Mid-Oceanic Ridge. These regions, in turn, are subdivided into provinces; for example, the Ocean Basin Floor consists of the Abyssal Floor, Oceanic Rises, and Seamount Groups. Each province is topographically delimited, briefly described, and illustrated with profiles and photographs of echo-sounding records. Close correlation is noted between the physiographic provinces that are established by the authors and crustal structure and bottom sediments.

This work is one of the "essential" books that should form part of the library of every physical geographer. The authors plan additional studies of a similar character for other parts of the world's oceans. Their publication is eagerly awaited by the geographic profession.

G.F.D.

Grasslands. HOWARD B. SPRAGUE, ed. Publication No. 53. American Association for the Advancement of Science. Washington, D.C. 1959. xv and 406 pp. illust. $9.00.

Almost 1 billion acres of land in the United States, or approximately one-half its total area, is more or less in grass – range grass, pasture grass, silage grass, and hay grass. The above publication is the end product of a symposium presented at the New York meetings of the AAAS in December, 1956 to survey the role which grass plays in our national economy and to review the state of our knowledge relating to this most widespread type of vegetation.

Contributors to the volume represent a wide range of sciences, both basic and applied, and their viewpoints on the subject are as divergent as are their fields of specialization. Representative of the writers are soil scientists, entomologists, meteorologists and climatologists, engineers, dairy scientists, ecologists, agronomists, and botanists. Despite the diversity of interests, the theme of "grass" serves as a binder to bring a degree of cohesion to the varied reports that make up the book.

The 37 papers are arranged under eight headings, as follows: (1) Sciences in Support of Grassland Research, (2) Forage Production in Temperate Humid Regions, (3) Engineering Aspects of Grassland Agriculture, (4) Forage Utilization and Related Animal Nutrition Problems, (5) Evaluation of the Nutritive Significances of Forages, (6) Grassland Climatology, (7) Ecology of Grasslands, and (8) Range Management.

This volume should prove timely and helpful to the geographer who is desirous of keeping abreast of progress on the broad front of grasslands research beyond the field of his own specialization.

G.F.D.

International Map of the World on the Millionth Scale (1958). United Nations, Department of Economic and Social Affairs. Columbia University Press. New York. October 1959. iii and 103 pp. $1.00.

This is the latest annual report on the status of the millionth map of the world. Section I, consisting of eight pages, summarizes recent decisions of the United Nations relative to specifications of International Map sheets, and includes an account of the work of the Second United Nations Regional Cartographic Conference for Asia and the Far East held in Tokyo in 1958. Section II, comprising the bulk of the volume, includes a revised list of all published sheets in the map series as well as an index map of the world showing the

present status of coverage. The map list includes, for each sheet: (1) identification symbol, (2) special series title if any, (3) designation (name), (4) publishing country, (5) year of publication, and (6) remarks. A handy list of publishing agencies in various countries, and an alphabetical index of sheets by names, conclude the report.

G.F.D.

The Living Forest. JACK MCCORMICK. Harper and Brothers. New York. 1959. 127 pp. illust. $3.95.

This little book aims at a large audience. It is well illustrated with a variety of photographs, realistic drawings, and diagrams. It embodies many of the ecological principles which are currently being taught in the universities to biology students, and which are gradually cropping up in other academic spheres such as nature study, adult education, journalism, industry, and land reform. The book comprises nine chapters, as follows: 1—Nature's city, 2—The life of the forest floor, 3—Forest insects, 4—Forest tree diseases, 5—Weather in the forest, 6—Stories a stump can tell, 7—The forest of North America, 8—How nature harvests the forest, and 9—Man and the forest.

The author is in charge of the Hall of North American Forests at the American Museum of Natural History and this book is, in a sense, an expanded guide to that exhibit and a commentary on the underlying ecological mechanisms and theories. It makes good reading and is sure to stimulate interest in the inter-relationships of living beings and their environment by drawing attention to familiar landscapes many times seen but not well observed.

PIERRE DANSEREAU
Universite de Montreal

Maya: The Riddle and Rediscovery of a Lost Civilization. CHARLES GALLENKAMP. David McKay Co., Inc. New York. 1959. xi and 240 pp. illust. $5.50.

This book deals with an ever-fascinating aspect of the pre-Columbian civilizations of the New World, and might well be subtitled "the rise and fall of the Mayan Empire." The author begins with a brief background chapter which discusses the Spanish discovery and conquest of Middle America. The second chapter provides an insight into the ways in which some knowledge of the Mayas at the time of the Spanish conquest was preserved, as well as explaining why so many of the Mayan records were destroyed. The explorations of John Floyd Stephens, who rediscovered the Mayan cities, is treated in the third chapter. Subsequent sections deal with the major eras of Mayan development: the formative, classic, and disintegration periods. Cities exemplifying each of these times, as well as information concerning the life of the Mayas in each period, are discussed. Details of tombs, temples, and other structures found in the cities are described. End paper maps showing the locations of known Mayan cities, and a number of excellent photographs, are included.

The book is written in an interesting style, using layman's rather than technical archeological terminology. Travelers to Middle America, as well as geographers, should find the book worthwhile.

P.R.G.

Midland: The Economic Future of a Texas Oil Center. ROBERT H. RYAN AND LEONARD G. SCHIFRIN. Bureau of Business Research. University of Texas. Austin. 1959. xiv and 125 pp. illust. $3.00.

In the last few years the Bureau of Business Research of the University of Texas has attained a respected and well-deserved reputation for producing research studies of regional economic development in Texas that contain: (1) terse but penetrating analyses of the background of current conditions, and (2) dauntless prognostications of economic things to come. This latest effort is focused on a single, medium-sized (pop. 44,500), oil town, the administrative center of west Texas' Permian Basin.

More than half of the 91-page text in this soft-cover volume is devoted to Midland's geographic and economic background; after a brief historical introduction there are separate chapters on the physical setting, agriculture, and population-employment. A detailed chapter on the "Emerging Pattern of the Midland Economy" points up the city's overwhelming dependence on a single basic activity, the extraction of petroleum and natural gas. The concluding chapter

maneuvers resolutely in a field where geographers generally are loathe to tread, the dangerous realm of prediction, and projects petroleum demand, Midland employment, and Midland population to the year 1980.

The book is written in the usual pleasant and sprightly style of Bureau staffers, and contains a considerable amount of geographic information, much of which, unhappily, is not well documented. There are six excellent maps, 44 tables and charts, a 33-page statistical appendix, and a five-page synopsis.

This is an interesting case study of a specialized city that will fit well on the book shelves of the urban or economic geographer or the scholar with a regional interest in the Gulf Southwest.

TOM MCKNIGHT

University of California

Oxford Economic Atlas of the World. Second edition. Prepared by The Economist Intelligence Unit and the Cartographic Department of The Clarendon Press. Oxford University Press, Inc. London and New York. 1959. viii and 152 pp. $6.75.

This excellent atlas has been revised and expanded to provide current maps and statistics useful to geographers, economists, students, and business enterprises. Increased emphasis has been placed upon nuclear fuels, and upon minerals such as zirconium, lithium, and antimony that have recently come into greater or more varied use.

Commodity production maps on a world basis include cereals, fruits, beverage crops, tobacco, sugar, forest products, vegetable oils, livestock and products, fibers and textiles, fuel and power, iron, steel, ferro-alloys, non-ferrous metals, other minerals, and selected industries. There are also a number of world maps of such items as landforms, climatic conditions, soils, population distribution, and communications; as well as several pages of physical-political maps of continents and portions of continents.

Graphs, statistics, and textual material accompany most of the maps. Appendices include statistics on production, trade, imports, and exports by political units; notes on commodities; and monetary arrangements.

An only slightly abbreviated, paper-bound version of this atlas, *The Shorter Oxford Economic Atlas of the World*, contains 128 pages and sells for $2.95.

P.R.G.

Philips' Library Atlas. HAROLD FULLARD AND H. C. DARBY, eds. George Philip and Son, Ltd. London. United States source: Denoyer-Geppert Co., Chicago. 1959. xxiv and 208 pp. plus 88 pp. index. $9.00.

This superb atlas is a completely redesigned and much enlarged version of five predecessor editions. In the reviewer's opinion, it offers one of the best products of its kind that the knowledge and craftsmanship of scientist and artisan can produce.

The maps in the atlas are grouped into sections. Part one, 176 pages in length, includes chiefly physical (topography, geology, climate, soil, natural vegetation) maps and political maps of all or parts of the world at scales ranging from 1:1 million to 1:300 million. Also in this section are a number of population density maps. Part two, 32 pages in length, consists of economic maps, mostly on a world and continent basis, showing the distribution of selected agricultural, mineral, forest, and fishing products. In addition, there are land use, industrial, transportation, and trade maps. The atlas is rounded out with a unique 14-page series of over 200 world climatic graphs in the introduction, and a 50,000 entry place name index in the conclusion.

The editors succeed in their presumably contradictory stated goals of increasing the scales of the sectional maps and yet retaining easy portability and convenience of use. These aims are accomplished by including smaller than normal areas in the sectional maps and restricting the size of the atlas to 9 by 11¾ inches. The selection and sequence of map colors is both pleasing and effective, color register is good, and map type is clear and readable.

G.F.D.

Problems of the Pleistocene Epoch and Arctic Area. GORDON R. LOWTHER, compiler. McGill University Museums, Publication No. 1. McGill University, Montreal. 1959. 119 pp.

This publication contains the texts of eight papers, selected from the 29 presented at a seminar initiated by P. S. Martin and held weekly at the University of Montreal and at McGill University during 1957 and 1958. Some papers represent original research, others are summaries of the results of previous research.

John Albert Elson, McGill University Department of Geology, discusses the classification and chronology of the Pleistocene for the non-geologist participants. Paul Sidney Martin, University of Arizona Geochronology Laboratories, comments on Pleistocene biotic change, based on biogeographic evidence plus the fossil record. L. S. Russell, National Museum of Canada, deals with the mollusks and mammals of the North American Pleistocene. Svenn Orvig, McGill University Department of Geography, surveys climatic changes during the Pleistocene, suggesting that the glacial phases were probably contemporaneous throughout the Northern Hemisphere.

Maxwell John Dunbar, McGill University Zoology Department, traces the marine history of the Pleistocene in the North, based on analyses of deep sea sediment cores from the Arctic Basin. Gordon R. Lowther, McGill University McCord Museum, establishes the approximate correspondence of the Pleistocene with the Paleolithic, and compares classificatory systems used in European and North American archeology. Askell Love, Institut Botanique de l'Universite de Montreal, traces the origin of arctic flora, pointing out need for a manual of these flora, and noting differences between arctic and temperate plants as a guide to their origin. He mentions the importance of polyploidy in distribution of arctic plants; also evidence of prolonged isolation from other floras. J. Brian Bird, McGill University Department of Geography, reviews recent contributions to the physiography of northern Canada, citing the development of aircraft and airfield construction, and the increased attention by the Canadian people and government to the needs of the North, as key factors in the progress of physiographic research in the last 15 years. A list of all papers presented during the two years of the seminar concludes the volume.

ERNEST M. HARWOOD, JR.
Arctic Institute of North America

Selected Maps and Charts of Antarctica: An Annotated List of Maps of the South Polar Regions Published Since 1945. RICHARD W. STEPHENSON, compiler. Map Division, Reference Department, Library of Congress. Washington, D.C. 1959. vi and 193 pp. $1.50.

Shortly after World War II several nations, especially the United States, reactivated serious scientific interest in, and geographical exploration of, the extensive but little-known region generally referred to as Antarctica. More recently Antarctica has served as a testing ground for scientific observation and research during the International Geophysical Year. The need for continuous research and exploration in Antarctica became obvious during the IGY. Fortunately for science, for international cooperation, and for understanding among the participating and interested nations, this need has been recognized and the age-old scramble for vested interests has been shelved in the recently signed twelve-nation pact making Antarctica a vast scientific reserve. It is, of course, obvious that this recent history of interest in Antarctica has given rise to a rapid increase in both large-scale and small-scale maps of the region, and that with international cooperation this increase and the variety of coverage will continue. However, the usefulness of such cartographic information is largely dependent upon the dissemination of knowledge concerning its availability.

To those of us who have a special interest in the mapping of Antarctica, and to all who have a general interest in the rapidly changing face of this "last great frontier," Richard W. Stephenson's compilation of some 514 different maps is an invaluable basic source of information. It is gratifying to learn that copies or facsimilies of all maps listed and described are available in the Map Division.

Mr. Stephenson notes (p. vi) that, "In general, each entry includes the author of the map, its title, the place of publication, date, color notation, scale, approximate size in inches, projection if on the map, and the language if non-Roman. . . . To facilitate the use of this bibliography, an index has been set up in three sections. The first lists items by date of publication; the second records maps of the whole continent ar-

ranged by scale; the third is a general index including areas, subjects, cartographers and publishers."

Mr. Stephenson deserves praise for the excellence of his work and the quality of his map descriptions. He is to be commended for giving so much of his own time to preparing this useful bibliography. This work continues the fine record of publications in cartobibliography for which the Map Division has gained international recognition.

HERMAN R. FRIIS
The National Archives

Surveyor of the Sea: The Life and Voyages of Captain George Vancouver. BERN ANDERSON. University of Washington Press. Seattle. 1959. xii and 274 pp. $6.75.

Historical geographers and cartographers will find this study of Captain George Vancouver's hydrographic surveying and charting of the northwest North American coast and the Hawaiian Islands in the late 18th century rich source material. A book version of a doctoral dissertation in history, this publication is primarily a biography and evaluation of Captain Vancouver's work in carrying out a directive of the British Admiralty to search for and chart a northwest passage through North America.

The author is a seafaring veteran and a retired Rear Admiral, U.S. Navy, who was on hydrographic surveying duty in the North Pacific over a century and a half later than Vancouver. Admiral Anderson, with high appreciation for Vancouver's professional proficiency and devotion to his mission, selects his materials from a voluminous collection of eighteenth century records, manuscripts, logs, and journals of the expedition. He well documents his argument that Vancouver was an underrated man of his time, and that he made important contributions to geographical knowledge through his Admiralty charts as well as to British diplomacy in the Pacific Ocean hemisphere during his expedition of 1790 - 1795. Admiral Anderson speculates that, had British statesmanship used Vancouver's expeditionary work to full advantage in later years, they would have been able to include the Hawaiian Islands and the present State of Washington within the Empire, and would have had a stronger claim to Pacific Northwest territory.

Historical geographers will find rich descriptive material of places in South Pacific waters. The expedition wintered three seasons in the Sandwich Islands (Hawaii) and visited Spanish California at Monterey and San Francisco Bay. Vancouver was highly interested in the Hawaiian Islands and in building up British prestige among the local chieftains. One of his contributions was the introduction of cattle to the islands, which served as a logistic supply source for British shipping. Meats, vegetables, sauerkraut, and milk were important dietary items obtained from Hawaii, Spanish settlements in California, and at Nootka Sound, Vancouver Island. Vancouver was especially proficient in logistic and dietary planning which kept his expeditionary personnel in good health and morale, free of scurvy, and devoted to mapping instead of fur trading with the natives.

Geographers interested in place name origins will find this a good primary reference. Vancouver left an indelible stamp on western North American cartography with his accurate charts and their some 300 names of mountains, bays, headlands, sounds, islands, and straits. British Columbians have long appreciated his contributions. They honored him by giving his name to the metropolis of the Canadian Pacific Coast and its largest island.

WOODROW R. CLEVINGER
Seattle University

This Sculptured Earth: The Landscape of America. JOHN A. SHIMER. Columbia University Press. New York. 1959. xii and 255 pp. illust. $7.50.

Each year millions of vacationing Americans scurry across the face of their land in endless quest of new places. Pitifully few see much that Nature has to offer in their mad dash along billboarded superhighways; and fewer still comprehend what they see. It is for the thinking traveler, with no formal training but an inner urge to know, that Dr. Shimer has fashioned this highly readable and beautifully illustrated study of the geology and physical geography of the United States. Between its covers are told the story of America's mountains and plains, its coasts and waters—all

in words the layman can comprehend but with the knowledge and accuracy that only the specialist can command.

This book may in no sense be considered a travelers' guide; its materials are not arranged in chronological order as one follows U.S. Highway 1 or 40 or some obscure legislative route. Instead, subject matter is organized in systematic fashion under chapter headings such as The Plains, Volcanic Landscapes, The Legacy of the Glaciers; and illustrations of principles are plucked by the author at random from throughout the country. This book is intended to be read before rather than during a trip.

Perhaps the reviewer is mistakenly giving the impression that *This Sculptured Earth* is fit only for the geographically and geologically illiterate. Far from it! He himself spent a number of pleasant and profitable hours renewing acquaintances with facts and ideas long forgotten and encountering fresh viewpoints. It is his conviction that others among geographers, and especially those teaching a course in North America, could profit from an armchair visit with Dr. Shimer to the sculptured earth of America.

G.F.D.

Three Centuries and the Island. ANDREW H. CLARK. University of Toronto Press. Toronto. 1959. xiii and 287 pp. illust. $10.00.

The purpose and scope of this book is broadly described in its subtitle, "A Historical Geography of Settlement and Agriculture in Prince Edward Island, Canada." The historical slant of the study is evidenced by the time-oriented titles of many of its nine chapters, viz. "Abegweit: Mid-Seventeenth Century" (Chapter II), "Ile St. Jean: Eighteenth Century, First Half" (Chapter III), "The Island of St. John: Eighteenth Century, Second Half" (Chapter IV), "The Colony of Prince Edward Island: Early Nineteenth Century" (Chapter V), and so forth. Within each chapter, however, the viewpoint taken is essentially that of a space-oriented geographer, as the inclusion of 155 maps confirms.

Chapter subheadings, selected at random while thumbing through the volume, give clues as to the topics treated. These include, among many, "The Geography of Nature," "The Settlers Come," "Population Origin," "Confederation, Roads and the Railway," "Field Crops," "Tenure of the Land," and such like.

Clark's detailed analysis of a fragment of Maritime Canada is obviously the product of exhaustive research and, together with his earlier study of a similar nature on New Zealand, ranks him as one of the foremost historical geographers of the present time. A hundred more such studies, by Clark and other members of the profession, would be welcome.

G.F.D.

Vegetation of the Outer Banks of North Carolina. CLAIR A. BROWN. Louisiana State University Coastal Studies Series No. 4. Louisiana State University Press. Baton Rouge. 1959. x and 179 pp. illust. $3.00.

There are not too many botanists who produce monographs that are useful for the geographer without losing their significance for the botanist or the ecologist. Clair Brown's treatment of the vegetation of the Outer Banks of North Carolina, presented in a handsome offset printing with a few diagrams and many well-contrasted photographs, certainly satisfies the requirements of many categories of readers.

This is a land-use study, or maybe more accurately a vegetation-history study. The first part is devoted to the historical record, from the points of view of botanical exploration, of human exploitation, and of reclamation (beach-erosion work, 1936-1940). The story is presented very convincingly of forests which used to extend eastward of their present position, and which have been destroyed by the progress of the Atlantic over weak sand barriers because of rising sea-level or land subsidence as well as wind erosion of the antedunes.

Botanico-ecological reconnaissance by the author yields five main habitats, with subdivisions, as follows: 1—Sea beach, II—Dunes, A—Live dunes, B—Grass-covered dunes, C—Wooded dunes, III—Sand flats, A—Interdunal (restricted), B—Open, 1—Dry, 2—Moist, a—Freshwater, b—Brackish to sa-

line, IV—Tidal marshes, and V—Ponds. This scheme is illustrated by a series of typical transects on Hatteras Island which shows typical zonation. The literature on maritime shore zonation in America and elsewhere is extremely abundant, and some key references are given. But the author quite properly concentrates on a factual account of the areas he is able to study in detail: Ocracoke Island, Roanoke Island, Currituck Island, and Currituck Peninsula. The plant communities are not actually referred to as such; rather, a correlation between certain indicator species and microtopographic factors is sought.

A most valuable chapter is devoted to "a century of change at Cape Hatteras" which is documented by aerial photographs and which gives evidence of the rather rapid rate of change. Another chapter concerns "salt spray injury" which is not, in all cases, easy to distinguish from wind desiccation, especially that which is due to gales and hurricanes. Yet another chapter reviews "plant materials for sand binding." Here both native and naturalized species are considered, as well as possible introductions.

Some 30 pages are devoted to a "catalogue of plants observed on the Outer Banks." This is presented in the taxonomic order of the families, which makes the individual species hard to find for the nonbotanist. The list gives scientific and popular names as well as local distribution and prevailing habitat.

Similar monographs of this kind are sorely needed. It is to be hoped that other able botanists like Clair Brown can be persuaded to make equivalent endeavors, for instance, on the Atlantic Coast to the north of the Carolinas.

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World Guide to Field Clothing Requirements. MERLE E. SPRAGUE AND CARL W. ROSS. Technical Report EP-115. Quartermaster Research and Engineering Center, Environmental Protection Research Division. Natick, Massachusetts. July 1959. iv and 40 pp. plus 2 unpaginated maps.

This publication is an interesting contribution to the field of applied climatology. It has been preceded by a series of booklets relating to climatic conditions that affect the choice of clothing issue by the Army Quartermaster General. As such it is a summation and correlation of much of the previous work of the Natick group.

Two maps present the basic findings of this report. The first is a map of world clothing requirement areas, designated by nine types of field clothing issue, primarily based on mean daily minimum temperatures for the coldest and warmest months. The second map is a world guide for the issue of hot-weather and overwhite uniforms. Essentially it is an areal color guide to uniform assortments for camouflage purposes, based upon duration of seasons in the various parts of each continent. A series of tables prescribes the exact clothing issue for each of the requirement areas.

Of particular interest to geographers are the appendices. A geographic index delimiting each requirement area provides necessary information for specific locations within the larger areal classifications. An alphabetical index to countries, territories, and islands designates the clothing requirements in each. There is a comprehensive bibliography of 57 entries which should be of value to workers in the field of climatology.

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Michigan State University

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